

Thursday, January 14, 1982

Thursday, January 21, 1982 Number 792 30p

Competitor for BT in value added field

by David Crover

ONE of the first companies to apply for a licence to offer added value services in competition with British Telecom over its telecommunications networks will be Commercial Cable Co, the UK subsidiary of International Telephone and Telegraph.

At the same time, an ITT spokesman in New York has confirmed that talks are taking place which could lead to ITT's communications services group, of which Commercial Cable is a part, being set up as a separate entity. This would take the form of either a new public company or a joint venture with another company.

ITT's fast growing communications service group is in need of additional capital to expand its business. That includes ITT's role as the leading carrier of international telex from the US, and its new domestic telex and telephone services.

The spokesman says that the talks have been "more in-house than with other corporations", and that speculation concerning the group is "very premature".

"Nothing definitive is going on," he adds, and decisions will be at least until ITT's offer for sale of its US forest products subsidiary, ITT Rayonier. That could bring in \$3.3 billion and solve the capital requirements.

Commercial Cable's entry into the market for value added telecommunications services, which will probably involve telex, is made possible by the government's moves towards deregulation. That allows value added services to be sold in competition with BT as of this year, with the first licence expected to be issued by the Department of Industry no sooner than April.

Laser printer

SPERRY Univac has introduced a plug-compatible version of IBM's 5800 laser printer, based on its own 0777 laser printer for use on-line or offline.

AT&T buys stake in Irish telecoms

by Kevin Cahill

AMERICAN Telephone and Telegraph, the giant American telecommunications company, is in the final stage of negotiations to take a significant stake in Ireland's biggest electronics company, Telecton.

AT&T has just reached a historic agreement with the American government's antitrust department to divest itself of two thirds of its assets in the shape of local American telephone companies (see page 2).

As a result of this agreement, and of deregulation of telecoms and data transmission in the States, AT&T is expected to become much more active in the field of electronics and computing, with the Irish deal probably the first of several in Europe.

The choice of Telecton, an unquoted private company in Dublin which employs about 800 people

Battle of IBM and AT&T

● From front page

When it was filed, IBM had an estimated 70% of the world mainframe market. More recently, IBM's share has been estimated at under 60%.

The government's case against IBM never appeared to hold back the company from competing vigorously, particularly in recent months when its pricing of the IBM personal computer and other products was seen as particularly competitive.

IBM's defence of its case had always been that it provided superior products and services, and it was these, rather than any other factors, which accounted for its large market share.

Most industry analysts believe the dismissal of the case will have no significant effect on IBM or

and which had turnover of £10 million according to the last published accounts, is directly connected with Telecton's £40 million participation in the £800 million redevelopment of the Irish phone system.

The major contract for the modernisation went to CIT Alcatel of France, but with substantial local subcontracting guaranteed to Irish companies, such as Telecton.

Telecton has traditionally been strong in transmission equipment. The deal with Alcatel will draw Telecton into digital switching systems and is scheduled to produce 1,000 new jobs in the jointly owned company, which will have its manufacturing base in Bandon, Co. Cork.

Irish sources suggest that the price to be paid for the AT&T stake of 45% will be about £18.6 million, based on the £181.9 million Guinness paid recently for a 26% stake in the company.

A spokesman for AT&T confirmed that the American company was buying into Telecton because of the latter's European connections and its exports to 65 countries.

AT&T, which will not be buying any part of the Guinness stake, said that there was a natural match between new telecoms transmission equipment developed by AT&T and Telecton's existing product line. AT&T would be introducing this equipment to Telecton for manufacture in the first months of their collaboration.

AT&T also hoped to offer the new equipment to the Irish PTT authorities as part of the supplies for the £800 million redevelopment.

Sources in Dublin suggest that Telecton's final participation in the contract over the next four years could be worth up to £80 million.

'UK must aim for standard software'

by Claire Gooding

BRITISH real time software specialists must move away from bespoke projects and aim at producing standard software products or modules.

This was the conclusion of a report on real time software research and development in the UK from the National Economic Development Office. The report paints a picture of an industry whose potential is being wasted on fragmented and duplicated development work.

According to NEDO, even the largest companies are having problems in producing generalised high-level software tools, and for small British companies such investment undertaken individually is out of the question.

In answer to these problems the report recommends that major public sector customers in the UK get together to define a shortlist of software tools and methods for all new contracts, and that the real time software companies themselves co-ordinate developments and pool their expertise.

The NEDO report held up as an example the Japanese, or more accurately, Toshiba Corp. Toshiba's Heavy Apparatus Division, which produces nuclear reactors and other heavy engineering, set up a software factory of 2,000 employees to develop real time software for industrial process control and related areas.

The only example of similar co-ordination NEDO could find in Britain was the British Telecom System X project.



CHISHOLM... "Japan offer 25-year warranty."

John Chisholm of CNA, a software specialist, agrees with the report that perhaps it does not allow for enough on government work for the real time software industry. "We are not big enough to do the strength of the Japanese," he says, "concentrating on the problem not the product."

Their techniques had to be productivity, to usable software and less than in the past. Their software is to have 0.8 bugs per thousand per year compared to 30 in the past. They offer a 25-year warranty. Our industry has rationalised along the lines of the report if we are to compete that."

The report suggests a central mechanism set up by government to co-ordinate support for real time software development teams and joint development teams of software suppliers and public sector customers.

In the meantime the Ministry of Defence could make use of versions of tools available at Royal Signals and Radar School seminars to further standardise tools. (Leader page 13.)

Swansea system for tender

PRIME Minister Margaret Thatcher seems to have scotched a suggestion that a replacement for the system at the Driver and Vehicle Licensing Centre in Swansea should not go out to general tender. She has issued instructions that there is no reason to depart from the normal rules of government procurement.

The issue has yet to go to Cabinet. Despite the growing overload on the current system, there is no sign that Transport Secretary David Howell is ready to act. Both current supplier, ICL, and would-be bidder IBM, are waiting to leap in when he does.

ITT launch

IN the week when ITT Consumer Products launched the 3030 personal computer, ITT Business Systems has introduced a range of word processors which, it claims, can replace most microcomputer functions. Record processing facilities are included in the £5,200 price of the 3100 Scribe word processor. ITT 3030 details, see page 5.

Draft standard

INCREASING commercial use of Pascal has led the American National Standards Committee to produce a draft version of a standard. The aim is to promote the portability of Pascal programs between systems. The standard includes a change to the syntax used to specify parameters which require the use of specific headings.

Inmos start

MANUFACTURE of 64K RAM chips will begin at Inmos' new factory in Wales later this year, probably in July. Inmos, whose majority shareholder is the British Technology Group, has been producing all its chips in the US. Turnover of the company has now reached over \$1 million a month.



TRAMIEL... "We are the American Japanese."

Micro for all users is close

by Robert Parry

ONE more step towards the universal microcomputer has been made with a decision by industry pioneer Commodore to make rivals' software run on its own machines.

Plans for a machine that would emulate personal computers from rivals Apple, Tandy and IBM have been announced by Commodore chief executive Jack Tramiel. Two new personal computers and a video game doubling as a micro were introduced at the recent Consumer Electronics Show in Las Vegas.

The proposed emulator will be an option on the Commodore 64, one of three new launches. Using plug-in circuitry, it will run programs written for other microcomputers without change, giving access to a wealth of proven

application software without expensive development by Commodore. The planned price, below \$1,000, would undercut rival products by a factor of between two and four.

The introduction of a machine emulating rival hardware like this is expected to lead to machines of comparable capability becoming highly price competitive. As with the IBM plug compatible mainframe market this would reduce profitability on hardware and lead manufacturers to seek more of their margins from software.

The emulators are likely to sell mainly to the business market, though Tramiel has been reported as saying that they could cut into sales of existing products lines, sold mainly in the consumer field in the US. "We'd prefer to compete with ourselves than

have someone else complete with us," he told the Wall Street Journal. "We are the American Japanese. We don't want to invent anything; we just want to make sure we have the best."

Commodore's emulator is likely to be shown first at the Hannover Fair in April, by which time the other machine should be available in the US. They are not likely to appear on European markets until late this year.

All three machines are aimed at the lower end of the personal computer market, and according to Commodore offer better facilities at lower prices than established machines.

The Commodore 64, with 64K RAM readily expandable to 128K, is aimed at machines with 40-column colour displays such as the Apple II and Atari 800.

IBM worldwide profits take a \$200m tumble

by Kevin Cahill

THE recession is tough for everyone - and IBM this week showed it is no exception. The worldwide 1981 results, published just 18 days after the close of the books at the year end, show that IBM's profits were down \$200 million to \$3.3 billion compared with 1980.

The fall followed a 22% drop in the third quarter's profits and a 12% fall in the fourth quarter.

IBM president John Opel blamed the profit fall on the stronger US dollar and foreign currency translation.

He said that while the translation of assets and liabilities resulted in exchange gains, the translation of income and expenses of the non-US operations had a significantly adverse effect on results.

Sales turnover was up by \$2.85 billion to \$29.07 billion. This is greater than the combined sales revenues of the next ten US computer companies including DEC, NCR, CDC, Honeywell, Sperry, Hewlett-Packard and Xerox.

Overseas sales rose only fractionally, from \$13.7 billion in 1980, to \$13.9 billion in 1981, and profits from overseas operations fell away sharply from \$1.9 billion to \$1.23 billion in 1981.

IBM reckons that had exchange rates remained constant at 1980 levels foreign profits would have been \$600 million higher. During last year the company is reckoned to have taken up billions of dollars in long and medium-term debt, above the \$5 billion credit lines showing in the 1980 balance sheet.

No mention of the cash or debt

position is made in the preliminary accounts but Lee Margosian, computer stock analyst at Wall Street brokers Wood Gundy, reckons that capital expenditure peaked in 1981 and consequently IBM's debt position is improving.

Sanford Garret, analyst at brokers Paine Webber Mitchell Hutchins, expects the company to be shipping large volumes of its top-of-the-range 3081s in 1982 which will further ease its cash position, though he does expect some borrowing to continue.

Tom Crotty, analyst with the Gartner Group in the US, said that IBM's drop in earnings both for the year and for the final quarter was in line with expectations although the tax rate was a little higher than anticipated.

Crotty insists that the outlook for 1982 is rosy. "We expect strong year-to-year comparisons in the range of a 30% increase and we are currently estimating earnings of \$7.45 per share, but this depends on IBM announcing an additional large scale system in the first quarter for shipment by year-end."

He also referred to IBM's recently introduced early retirement scheme for employees in the US as a means of cutting overheads and opening up promotional channels within the company. The scheme applies mainly to positions eliminated as a result of reorganisation, which according to Crotty may be measured in thousands. It also applies to legal staff who would otherwise have to be retained in IBM's product range now that the Department of Justice has dropped its anti-trust case.

THE JAPANESE CONNECTION

Model	Price	Features
TMM2010P	£1,995	16K static ram 160Ks
TMM2010P	£2,495	16K static ram 260Ks 2710
TMM2010P	£2,995	16K static ram 260Ks 2710
TMM2010P	£3,495	16K static ram 260Ks 2710
TMM2010P	£3,995	16K static ram 260Ks 2710
TMM2010P	£4,495	16K static ram 260Ks 2710
TMM2010P	£4,995	16K static ram 260Ks 2710
TMM2010P	£5,495	16K static ram 260Ks 2710
TMM2010P	£5,995	16K static ram 260Ks 2710
TMM2010P	£6,495	16K static ram 260Ks 2710
TMM2010P	£6,995	16K static ram 260Ks 2710
TMM2010P	£7,495	16K static ram 260Ks 2710
TMM2010P	£7,995	16K static ram 260Ks 2710
TMM2010P	£8,495	16K static ram 260Ks 2710
TMM2010P	£8,995	16K static ram 260Ks 2710
TMM2010P	£9,495	16K static ram 260Ks 2710
TMM2010P	£9,995	16K static ram 260Ks 2710
TMM2010P	£10,495	16K static ram 260Ks 2710
TMM2010P	£10,995	16K static ram 260Ks 2710
TMM2010P	£11,495	16K static ram 260Ks 2710
TMM2010P	£11,995	16K static ram 260Ks 2710
TMM2010P	£12,495	16K static ram 260Ks 2710
TMM2010P	£12,995	16K static ram 260Ks 2710
TMM2010P	£13,495	16K static ram 260Ks 2710
TMM2010P	£13,995	16K static ram 260Ks 2710
TMM2010P	£14,495	16K static ram 260Ks 2710
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TMM2010P	£15,995	16K static ram 260Ks 2710
TMM2010P	£16,495	16K static ram 260Ks 2710
TMM2010P	£16,995	16K static ram 260Ks 2710
TMM2010P	£17,495	16K static ram 260Ks 2710
TMM2010P	£17,995	16K static ram 260Ks 2710
TMM2010P	£18,495	16K static ram 260Ks 2710
TMM2010P	£18,995	16K static ram 260Ks 2710
TMM2010P	£19,495	16K static ram 260Ks 2710
TMM2010P	£19,995	16K static ram 260Ks 2710
TMM2010P	£20,495	16K static ram 260Ks 2710
TMM2010P	£20,995	16K static ram 260Ks 2710
TMM2010P	£21,495	16K static ram 260Ks 2710
TMM2010P	£21,995	16K static ram 260Ks 2710
TMM2010P	£22,495	16K static ram 260Ks 2710
TMM2010P	£22,995	16K static ram 260Ks 2710
TMM2010P	£23,495	16K static ram 260Ks 2710
TMM2010P	£23,995	16K static ram 260Ks 2710
TMM2010P	£24,495	16K static ram 260Ks 2710
TMM2010P	£24,995	16K static ram 260Ks 2710
TMM2010P	£25,495	16K static ram 260Ks 2710
TMM2010P	£25,995	16K static ram 260Ks 2710
TMM2010P	£26,495	16K static ram 260Ks 2710
TMM2010P	£26,995	16K static ram 260Ks 2710
TMM2010P	£27,495	16K static ram 260Ks 2710
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TMM2010P	£39,995	16K static ram 260Ks 2710
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TMM2010P	£40,995	16K static ram 260Ks 2710
TMM2010P	£41,495	16K static ram 260Ks 2710
TMM2010P	£41,995	16K static ram 260Ks 2710
TMM2010P	£42,495	16K static ram 260Ks 2710
TMM2010P	£42,995	16K static ram 260Ks 2710
TMM2010P	£43,495	16K static ram 260Ks 2710
TMM2010P	£43,995	16K static ram 260Ks 2710
TMM2010P	£44,495	16K static ram 260Ks 2710
TMM2010P	£44,995	16K static ram 260Ks 2710
TMM2010P	£45,495	16K static ram 260Ks 2710
TMM2010P	£45,995	16K static ram 260Ks 2710
TMM2010P	£46,495	16K static ram 260Ks 2710
TMM2010P	£46,995	16K static ram 260Ks 2710
TMM2010P	£47,495	16K static ram 260Ks 2710
TMM2010P	£47,995	16K static ram 260Ks 2710
TMM2010P	£48,495	16K static ram 260Ks 2710
TMM2010P	£48,995	16K static ram 260Ks 2710
TMM2010P	£49,495	16K static ram 260Ks 2710
TMM2010P	£49,995	16K static ram 260Ks 2710
TMM2010P	£50,495	16K static ram 260Ks 2710
TMM2010P	£50,995	16K static ram 260Ks 2710
TMM2010P	£51,495	16K static ram 260Ks 2710
TMM2010P	£51,995	16K static ram 260Ks 2710
TMM2010P	£52,495	16K static ram 260Ks 2710
TMM2010P	£52,995	16K static ram 260Ks 2710
TMM2010P	£53,495	16K static ram 260Ks 2710
TMM2010P	£53,995	16K static ram 260Ks 2710
TMM2010P	£54,495	16K static ram 260Ks 2710
TMM2010P	£54,995	16K static ram 260Ks 2710
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TMM2010P	£57,995	16K static ram 260Ks 2710
TMM2010P	£58,495	16K static ram 260Ks 2710
TMM2010P	£58,995	16K static ram 260Ks 2710
TMM2010P	£59,495	16K static ram 260Ks 2710
TMM2010P	£59,995	16K static ram 260Ks

Clay firm aids jobless with comms venture

by Donald Kennett
IN an unusual foray into the communications industry, English Clay, best known for its quarrying, has started a joint venture with US company Western Union. A company will be formed to launch a range of new communications services in the UK over the next few years.

Like several other employers, notably Pilkington Glass in Lancashire, ECC finds itself the dominant employer in its community. Faced with declining manpower requirements at a time of generally rising unemployment, ECC set up a Local Enterprise Trust to ease the problems this has caused.

Planning chief Dr Terry Thorncroft said the company had always been indirectly interested in communications, because of its remote location and its connection with the paper industry. Most of ECC's output goes into coatings to make paper easier to print on.

In looking for businesses which could use the space and people available in the area, the opportunities opened up by the British Telecommunications Act and trends to working in remote locations were an obvious direction, he said.

ECC's first investigations were into voice services based on the Delta communications processor from the US. But the demise of Nexas, which was handling it in the UK, has been a setback. Other investigations with radio-telephone messaging company Air Call and with the British Technology Group are continuing.

ECC has now put up £100,000 for a 20% stake in Western Union Global Information Services, the joint venture which will be run primarily by WU.

It will spawn a whole series of separate operating companies to provide copies of WU's services in the US, nationally at first and then internationally, followed by a variety of other new services made possible by high technology and liberalisation in telecommunications.

The first service to go live is WU Priority Mail, in which a standard letter is merged with a personalised message and labelled from a mailing list. This is similar to the Post Office's Electronic Post service, started in London and Manchester last year.

Links have already been set up with this service for the first two mail shots - for the Department of Industry's Information Technology Year campaign and for ECC subsidiary Haven Holidays.

Based on computer facilities offered by its ICL 2956 and three ME29s, the group aims to build up to a part-time workforce of 350 over the next five years. It currently employs six.

David Craver adds: As a potential site for overseas investment in the electronics industry, the UK comes out top of the table in a survey of US companies.

But a withdrawal from the Common Market would change the outlook considerably, with nearly half of those now making the UK their first choice saying that leaving the European Community would make this country unsuitable.

The survey, by the organisation Electronics Location File, also shows a remarkable buoyancy within the US electronics industry, and of the 508 companies questioned, more than one in three has plans to establish overseas operations by 1985.



CURRAN... NAS is nudging Amdahl in market share.

PCMs in market share row

by Boris Sedacca
PLUG compatible mainframe manufacturers are becoming increasingly edgy about their relative market shares as they try to convince users of their viability as alternative suppliers to IBM.

Claims by Olivetti last year that it is number two to Amdahl among European PCMs have produced a flood of statistics from its rivals. Now National Advanced Systems measures and ahead of Amdahl on others in the increasingly tough fight to establish a permanent presence among European IBM users.

Olivetti is using its corporate muscle to subsidise an entry into the plug-compatible business, where it sells Hitachi mainframes as the OH3550 range.

But the company's claims have been rebuffed by both NAS and Magnuson.

John Curran, newly-appointed vice president for European marketing at NAS, says his company is nudging Amdahl in market share. "We are higher in terms of units installed, equal in revenue terms, though lower in mips (million instructions per second) installed in Europe than Amdahl."

Curran's careful definitions of market share include a mips rating as a way of comparing companies which supply different numbers of units with different processing power.

"We have a total installed base of 219 units, the largest out of any PCM in Europe, representing more than 400 mips. We grew by

60% in 1981 and installed 51 units of which 27 were NAS machines and 24 were Hitachi. We also increased our UK installed base by 50% from 17 to 25 units."

Mike Tucker, Magnuson's managing director, claims that his company's installed base also exceeds that of Olivetti. In a letter this week, he quotes a Nephron survey which puts Amdahl market share at 45.5%, NAS at 25.5%, Magnuson at 18%, Olivetti at 7% and BASF at 4%.

Meanwhile, Olivetti's managing director Derek Lewis last week clarified his company's position, saying that he was referring to machines installed or on order when he referred to the 12 new users in 1981, rather than machines installed.

NEWS BRIEF

GLC spends £3m to speed fire calls

THE Greater London Council is spending over £3 million on a computer system expected to halve the mobilisation time of its fire engine from an average two minutes to one.

The computer, which will be installed by the mid-1983, is made by Marconi Space and Defence Systems, and will be programmed with a street map of London, as well as data on availability of appliances, crew and equipment.

Japan tax link

JAPAN has become the 24th country to link to British Telecom's Bureaux International fax transmission service. The service is operated from 14 offices and the UK which offer collection and delivery of A4-sized documents, post, messenger or document.

Triple storage

NEW hardware and software for the six-month-old ICL System 25 computer will triple its total capacity to 1 Mbyte, and will connect it to a number of local VDU's and printers as well as support up to 40 terminals. So far ICL has taken orders for System 25.

Speed changer

THE irritating exception to the non practice that viewdata is by using split-speed transmission - 75 bits-per-second one way, 1,200 the other - has been overcome by London-based telecommunications consultant Double L Electronic Developments. It has developed a £110 speed changer for viewdata modems and data processors on computers or conventional terminals in their networks, to provide symmetrical 1,200 bps input and output.

System X order

BRITISH Telecom is to order a further 29 System X exchanges for installation over the next 10 years, bringing the total on order to 50. The exchanges will be installed in eight towns from Edinburgh to Guildford by the main UK telecommunications manufacturers, STC, Plessey and GEC. The order includes for OMC operations and maintenance centres which monitor and control the operation of exchanges in their areas.

Howard Karten reports on how America greeted the historic close of the IBM and AT&T anti-trust suits



LECHT... "I call it a clear and decisive victory for AT&T."

US industry yawns as IBM case is dropped

FOR the most part, domestic industry has reacted with a yawn to the conclusion of the US Justice Department case against IBM. Thirteen years and four administrations after it was filed, the Department concluded two weeks ago that its case had "no merits."

The reaction from Burroughs was typical of those from the industry. "Planning at Burroughs has always assumed intense competition. It appears we were right," said Michael Blumenthal, president and chief executive officer for the company in Detroit. "We have long felt the marketplace is where decisions should be made."

Glen Haney, a vice-president for strategic planning and development for Sperry Univac, said, "The ending of the suit against IBM is a relief for the industry... now that the suit has ended, we are in a better position to assess our competitors' posture in relation to both markets and products without having to consider such major and unpredictable events as an IBM divestiture."

The Gartner Group in Stamford, Connecticut, noted: "The



BLUMENTHAL... "The marketplace is where decisions should be made."

Department of Justice should have recognised many years ago that it had no case. IBM management had not had the Justice Department in mind in any decision made in years. Last Monday morning in Armonk, it was business as usual."

However, some IBM watchers were still willing to predict that IBM may be preparing to move into new fields, such as robotics and the service bureau business.

Slump in programming

by Maggie McLerrig
DEMAND for the average programmer is decreasing steadily, according to Bill Coudrey, managing director of Reward Regional Surveys.

Figures produced by RRS in a national analysis of salaries and wages support his opinion, showing that pay increases for programmers have dropped from 6% to 2% over the last six months. Increases for analysts have also been reduced, but not to such a degree: from 9% to 5%, and from 8% to 6% for senior analysts.

"There is still a high demand for the analyst programmer with specialist skills," commented Coudrey, "but the trend is towards buying in packages."

DP staff working for companies involved in North Sea oil are now the highest paid in the UK, closely followed by those in food, chemical and service industries based in London. The lowest paid areas are the Midlands counties, with the West Country a close second.

Pay increases in the industry have fallen dramatically throughout the country, and Coudrey thinks they will continue to drop. "Companies cannot afford to give 15 or 16% increases and remain competitive," he said.

A surprising statistic turned up by the survey was the number of one-man DP installations in existence, and Coudrey expects this to increase considerably over the next few years.

Big private PABX speed-up

by Donald Kennett
THE choice of large PABX's available for private supply is to be widened in advance of the government's schedule for liberalisation, thanks to British Telecom's agreement to evaluate test installations of equipment from six companies by the end of the year.

The first six manufacturers have been picked from an initial list of 29 companies that were invited to submit equipment. They are the widened in advance of the government's schedule for liberalisation, thanks to British Telecom's agreement to evaluate test installations of equipment from six companies by the end of the year.

'First viable IBM competitor' is let loose on the market

BACKED by its huge resources, the newly liberated US telephone giant AT&T will represent a potent competitor in the world computer industry, say US observers.

Until the anti-trust case was settled, AT&T was the largest company in the US. With assets estimated in excess of \$125 billion, arguably the world's finest R&D lab (it invented the transistor), and more than one million employees, the firm controls more than 80 per cent of all phones in the US.

The company is unwilling to reveal any of its future plans but current work at Bell Labs, its huge R&D arm, promises initially some interesting enhancements for the telephone service.

Among its innovations have been an early demonstration of a voice mail system, speed dialling, the use of the telephone system to monitor temperature and environmental conditions in buildings, call forwarding and call waiting, and similar services.

Other research aims at developing new ways of transmitting information - by phone. With AT&T now free to do "whatever it wants" in the words of AT&T chairman Charles Brown, that might include retrieving information from encyclopaedias, maps, wire services, and other material.

Bell Labs has been a leader in speech synthesis and voice recognition, and often comes up with helpful computer-based devices and services for the handicapped.

The lab is also believed to be mounting a significant effort in distributed data processing, which would be a natural tie-in to the sophisticated distributed computers that in effect constitute the long-distance network.

For the time being, however, most observers seem to be cautiously waiting and watching to see what happens in the wake of the settlement of the anti-trust suit, which came to a sudden, unexpected termination on January 8.

And now Justice Harold Greene

at a Federal District Court in Washington seems to have thrown a spanner into the works, with the announcement that he is locking the settlement pending his review. The judge, who had been hearing the anti-trust suit, has this power under a 1974 law, enacted following a widely questioned settlement of the US government versus ITT.

But there seems little doubt that the company will go ahead and sell off its low profit telephone operating companies, and make a dramatic entry into the data communications field.

Meanwhile, lawyers pore over terms, and businessmen make plans to launch or enhance other telecommunications businesses.

Although there is general agreement that costs for local subscribers will go up, the effect on the telecommunications and computer industry is far less certain.

Charles Lecht, the head of consulting firm Advanced Computer Techniques and maverick guru of

the industry, observed: "Most people are calling it a settlement - I call it a clear and decisive victory for AT&T. They have got rid of the (less profitable) part of the business and plunged headlong into the computer industry with a lot of high technology. They really have created the first viable IBM competitor in the US."

The statement of Glen Haney, vice-president for strategic planning and development at Sperry Univac, seemed typical of the reaction of large firms which might be affected.

"During the process of divestment over the next 18 months or so, our major concern will continue to be that there should be no possibility of cross-subsidisation between deregulated portions of AT&T. Such an advantage exploiting the monopolistic position that the suit was intended to correct, would create a threat not only to Sperry Univac, but to most other vendors in the computer industry," Haney observed.

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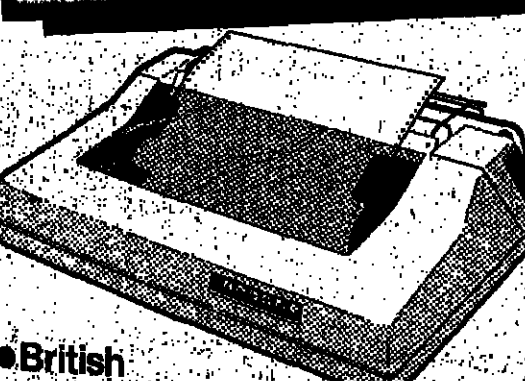
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Thursday
January 21, 1982
Vol 32 No 792

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IPC Electrical-Electronic Press Ltd, Quadrant House, The Quadrant, Sutton, Surrey SM2 5AS. Telex: 892084 BISPR G

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SALES BRIEF

TI system serves 22 institutes

ONE of the largest installations of a Texas Instruments computer system in the UK has gone to the Agricultural Research Council where it administers the funding of the 22 research institutes in England and Wales.

The configuration is a Texas Instruments DS990 Model 30 with 1 Mbyte memory capacity, 22 terminals, three Model 810 printers, one LP600 line printer, two LQ45 printers, magnetic tape drive, dual floppy disc unit and two 200 Mbyte disc drives.

100th sale

GI HONEYWELL BULL has sold its 100th computer, a DPS 7 series, to Adidas of Alsace, France. It will replace two existing GI-11B 7735 machines to run sales management, production control and personnel administration and will be at the centre of a network of 40 terminals controlled by four GI-11B Mini 6 minicomputers.

Swiss supplier

ADABAS Software has installed a Cambex ESP41 IBM 4341 compatible processor in its Derby office. The machine, with a two-Mbyte main store, was supplied by the Swiss company Software AG and will be used with Storage Technology disc and tape drives and ITT VDUs for software development, user support, administration and training.

Traffic control

PHILIPS has won a contract worth £2 million over two years to design and install a traffic control system for Glasgow. Philips previously won a contract for the Glasgow urban motorway signalling system. The traffic will be based on a Philips P875 mini-linked to 231 outstation transmission units running 400 traffic signal controllers and providing facilities such as a fire, priority routing program, diversion routing and car park information.

India first

FIRST export sales for System X may go to India, where GEC has been chosen to bid. British Telecom has always regarded the country as a priority market, and India last September deferred the closing date for tenders until March 31. GEC is being joined by its partners in British Telecom: Indian Systems, Plessey, STC and British Telecom itself.

MoD system

THE Ministry of Defence has ordered turnkey signal processing system from the specialist software house Prolog Computer Consultants of Picheham. The system will be based on the recently-launched 32-bit SBL 32/2750 from Gould subsidiary SBL Computer Systems. This will be Prolog's first installation based on an SBL machine.

Brewing up

FRIBRIGHT Computer Services has won a £95,000 order to design and install a computer system for Molelands, a brewery based at Abingdon, against competition from IBM and ICL. A Honeywell Level 6 microcomputer with ten terminals will be used for sales order processing, stock control, distribution, documentation, purchase order register and purchase ledger, sales forecasting, analysis and sales ledger.

Hong Kong link

SIA Computers has ordered two Prime Computers - a 550 and a 750 - to be installed at its Hong Kong and London offices. The former for time sharing services and the latter for link to the Hong Kong processor through Prime's interactive network system.



COLLINS... "We've concentrated on giving the end user support."

'Robust' Unix products help meet the shortage

by Claire Gooding

A CITY-BASED firm has leapt in to meet the shortage of commercial applications in the rapidly expanding market for the Unix operating system.

The company, CDS, has just released its Datapower database and a word processing system called Wordpower for use with Unix.

"Unix has a great number of facilities, but we have concentrated on making things watertight and giving the end user support," explained John Collins. He implemented the CDS products by refining on existing research products and making sure that they could stand up to unsophisticated end users.

Manufacturers have been readily buying Unix from its owner, Western Electric, for everything from 16-bit micros to IBM kit and Amdahl mainframes, but robust applications have been in short supply. Because Unix experience tends to be in scientific and academic fields, the commercial progress of the operating system has been held up.

CDS was set up to take advantage of the Unix boom by director David Saunders, who says he took a long hard look at the market and set about filling the gap with a strong team of commercial, technical and academic expertise. The City connection persuaded Western Electric to grant the first UK vendor license for the cheap Unix follow-up System III, he says.

Now the combination has stolen a march on other systems houses by being among the first to announce applications.

"After a visit to Western Electric we were persuaded that it

Control on shop floor

by Claire Gooding
PRODUCTIVITY on the shop floor is the latest area to be tackled by Unix, which is concentrating on vertical markets as a way of increasing software revenue.

The shop floor control system is called Unipac, for Universal Production Activity and Control System. It is designed to deal with all aspects of shop floor control, not just planning.

The system works from one common database so that all three areas of work order management, labour and facilities control, and material management are centrally controlled.

The system is modular and works with many giving users without computer experience the option to work on a question and answer basis.

It runs on the V77 minicomputer as a free-standing system or in distributed processing mode. Average cost is about £25,000 for a one-time licence, with a £1,500 p.a. option for maintenance.

was an area of significant growth," said Saunders. "It's exciting because it offers such wide facilities next to other OSs, as well as being easy to use and portable between mainframes and minis."

"There's a great need for portability," explained "programming

manager Andrew Twigger. "People buying in the mainframe and mini markets find that they can't move to smaller, cheaper machines, and although there are plenty of applications for micros, there are severe limitations in running them."

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'Prestel for blind' and Apple II CIS Cobol take 1981 Rita Awards

IMPORTANT new awards for the computer industry have been won by a device for the disabled and by one of the trail-blazers of British exports.

The Recognition of Technology Achievement (Rita) Award for hardware innovation has gone to Brailtel, a terminal which allows the blind to use Prestel. The Rita for a software product has been won by software house Micro Focus for its CIS Cobol on the Apple II.

Both awards were sponsored by Computer Weekly and were made as a result of voting by Computer Weekly readers at the end of last year. They were presented at a ceremony in Birmingham earlier this week by Minister of State Barney Heyhoe.

The awards were organised on the lines of Hollywood's Oscars. Readers were asked to submit nominations for the two categories of hardware innovation and software product for 1981.

Nominations were then narrowed down to three in each category by a panel of experts comprising Peter Hall, president of the British Computer Society, David

Fairbairn, director of the National Computing Centre, and Dr Eyleyons, director general of the Computing Services Association.

They selected Brailtel, Realisation's Teleputer and the Smith ZX81 in the hardware production, and Apple II CIS Cobol, Micro modeller sold by Indus (UK) and See-Why from IT Systems in the software product category. Readers were then given the chance to vote.

Their choice of Brailtel was particularly appropriate one for 1981 Rita since last year was the national Year of Disabled People. Brailtel was developed by microcomputer manufacturer Clark and Smith and allows the blind to access Prestel over the telephone line.

Assistance with its development came from the Royal National Institute for the Blind (RNIB) and the Manpower Services Commission, and it was developed in co-operation with Prestel.

Micro Focus is also a worthy winner, since it has been at the forefront of software exports and has recently won a Queen's Award for its achievements.



HANNA... "We are now in the computer business."

ITT set to challenge IBM in personal computer market

by Robert Parry

WITH its British-designed and German-built 3030 microcomputer, multinational conglomerate ITT is set to take on IBM in the personal computer market. The machine replaces the 2020, a version of the Apple II built by ITT under licence.

Hardware has been on sale in France and Germany since last October, but the UK launch was delayed until now so that application software would be available. It will be marketed in the US, though when has not yet been decided.

"We are now in the computer

business," says Herbert Hanna, managing director of ITT Consumer Products UK and European director for microcomputer systems.

He thinks the 3030 superior to the IBM machine and views the 2020 exercise with Apple as a way for ITT to gain experience to design its own system.

"We went in to learn the hard way," he says. All 2020s have now been sold by ITT and no more will be made.

The result of four years' learning, the 3030 is a modular system starting from a twin floppy

machine with keyboard, Z80A processor and 64K RAM costing £2,500 with software.

Operating systems standard with the machine are CP/M and MP/SL's BOS, allowing application packages in MicroCobol. Packages for word processing and database, Autowriter and Autodex are included in the basic price.

Various VDUs and printers can be attached and external memory can be expanded by adding a third floppy drive and one or two 5 or 10 Mbyte hard discs. Internal RAM can be increased to 256K.

The standard Z80A processor

can be replaced by an 8086, but Hanna does not see this happening until September because of the scarcity of 8086 application software.

Multi-user capability should be available by March and colour terminals and videotex links added later in the year. Expansion is simple as the system is based on Eurocard standard modules.

Marketing the 3030 will be through microcomputer dealers and software houses via ITT Consumer Products and direct to large business users by ITT Business Systems Group.

LAMSAC helps councils cut computer costs

by David Craver

HELP for local authorities to cut down the cost of developing their computer systems is coming from LAMSAC, the Local Authorities Management Services and Computer Committee. A survey is being made of 125 local service departments as the first step towards developing a software product. If

the initial scheme works, it is likely to be extended to other areas.

The survey, the results of which should be compiled by March, follows from the setting up of a Social Services Computer Applications Group by LAMSAC at the end of last year. If there is sufficient interest from local authorities, work

will begin on the package, possibly through the National Computing Centre's software products scheme. The NCC has expressed a willingness to discuss the project, which could eventually lead to the placing of a contract with an outside software house.

LAMSAC has developed products before using outside pro-

gramming, with participating councils sharing the costs. A package is about to be released which will enable councils to analyse the latest population census data. That contract was won by Durham University. Another software product is a planning system used by the London authorities for the analysis of property management.

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Baseband/broadband converter from 3M

by Donald Kennett

ONE way of resolving the conflict between broadband and baseband local area networking has been made available by 3M's Interactive Systems Group. The company has launched a pair of devices capable of converting baseband networks into broadband ones.

Broadband networks involve the extra expense of radio-frequency modems and remodulators, but can carry different types of traffic, such as television and data, on the same cable by using different carrier frequencies to support separate channels. In baseband networks, where data is put straight on to the cable as a digital signal, the transmission capacity is shared between connections by multiplexing. But in broadband networks each channel can be shared between connections.

3M has been supplying baseband networking equipment for about 10 years and has 30 installations in the UK, but the two types sold previously were designed to a single computer or separate frequency-division or time-division multiplexed channels. The time-division version has a maximum aggregate data rate of 100K bits per second.

The latest broadband modem, the 5991, can operate from 100Kbps to 2Mbps and can be inserted between the coaxial cable and the network interfaces in a baseband system, thereby freeing the cable to support other types of transmission, such as video or voice, on separate carrier frequencies.

As the best known local network designs - such as the Cambridge Ring and Ethernet - operate at either 4Mbps or 10Mbps, 3M plans to follow up with a 5Mbps modem in June and a 10Mbps one at the end of the year, all priced similarly to the 5991, at around £300 for one to £250 in OEM quantities.

The other device needed to implement a broadband network is the £1,000 remodulator which takes messages from the network input channel and re-transmits them on the output channel for the receiving devices to pick up. This is available now.

In June, in time for the 5Mbps version, the company is planning to launch a range of network attachments designed to support IBM 3270-style communications. The £3,300 5732 will act as an IBM 3274 cluster controller in communicating with up to 32 ports on the mainframe, while the £2,275 6708 and the £2,145 6704 will handle clusters of eight and four terminals.

For frequency-agile modems, which enable attachment to access more than one broadband channel, system builders will have to go elsewhere or wait until next year for 3M's version.

Intergraph aims high with low-end system

by David Craver

THE company which claims to have climbed in the past year to the world's No 2 position as a supplier of turnkey computer-aided design and manufacture systems, Intergraph, has launched a new system at the bottom of its range which is expected to give it an even bigger market share.

"Nice, but rather expensive" has been the usual verdict on the Intergraph CAD/CAM systems, says Trevor Postlethwaite, managing director of the American company's UK subsidiary. But the new interactive three-dimensional graphics design system, the 2302, which is built around Digital Equipment's LSI 11/23, will make Intergraph equipment available to more designers.

The new model, the 2302, costs about £17,000 for a basic configuration. Worldwide revenues climbed to some \$108 million in 1981, and he thinks that is enough to give Intergraph the No 2 position behind undisputed market leader Computervision.

But with the other contenders such as Appligon being taken over by Schlumberger, and Calma merged into General Electric of the US, he doubts that the figures will be released to prove his point.

Postlethwaite predicts a 50% growth for Intergraph in the UK in 1982, with "business really taking off".

CTL's desk-top sales set for speedy take-off

by David Craver

AFTER making only eight sales since entering the OEM market last June with a high-performance desktop computer system, Computer Technology of Hemel Hempstead admits to having been over-optimistic about how quickly it could achieve volume deliveries.

But sales of the highly priced 16-bit desk-top computer, from Convergent Technology of California, for which CTL acts as the UK distributor, are now running at about one a week.

And by March 40 systems will be delivered, with a "conservative estimate" of 200 systems in the plans for next year, according to Howard Parkinson, director of the OEM division.

"Interest is very high," Parkinson says, "and the prospect level is significantly greater than anything CTL has ever had before." The Convergent system is designed for distributed computing in a high speed local network.

Each workstation has its own 16-bit Intel 8086 microprocessor, 1 Mbyte of memory and a screen, with up to 17 stations clustered in a group.

Convergent Technology, the two-year-old Californian OEM which manufactures the systems, has signed long-term contracts with Burroughs, NCR, TRW, Santa Corp, and Thomson CSF of France, as well as a major procurement with the US Department of Transport through a Virginia software house.

As a private company which is expected soon to go public, Convergent president Allen Michels is reluctant to give many details of the company's operations. But he does say that over 1,000 machines have been produced so far, and the company has recently moved into a new 77,000 sq ft manufacturing facility, bringing total capacity to 100,000 sq ft.

There are plans to expand further, and Michels says there will be no problem in meeting the demand for systems. The contract with Burroughs, which entails a "very large" number of systems, a seat on the board and the potential for an equity stake, does not mean that Burroughs will gobble up the company.

"Not at all," claims Michels, who says Burroughs can only take up the option for a shareholding when deliveries reach a certain level, and then it will only represent a few per cent stake. Burroughs will release its small business system, codenamed the B20, in the spring.

NCR is basing the word processor which represents its entry into office automation on the Convergent machine, and TRW will distribute the system in Europe as a replacement for the Datapoint line.

TRW recently sold Datapoint distribution rights back to Datapoint Corp. Thomson CSF is expected to distribute in France, but the nationalisation of this company leaves the agreement in doubt.

Michels was enthusiastic about CTL's prospects - an "outstanding company," he says, which he hopes will "replicate for us in the UK the same success we have had in the US."

In the next few months, CTL will release Convergent's latest product, an application workstation which costs about half as much as the more powerful system. Based on the Intel 8088, it comes with built-in Winchester and floppy disc and is fully compatible.



FIELD... Another 200 this year.

Ontel word processor now costs 20% less

by Maggie McLening

REDESIGN of the Ontel word processor has resulted in a 20% reduction on the price of the widely-used Datatext standalone word and information processing system.

Formed in 1979 specifically to market Ontel equipment, Surrey-based Datatext now has more than 1,600 installations in the UK, and customers include Barclaycard, Shell, ICI, British Airways and British Caledonian. Prime also buys Ontel word processors to attach to its computers and sell as turnkey systems.

Changes in the manufacture of the casing, and there are two new keyboards to choose from. Compatible with existing Datatext installations, all the features of the previous system have been retained and command stringing and

mathematics facilities added. Twenty of the new word and information processing systems are on order, and Derek Field, managing director of Datatext, is confident that a further 200 will be sold this year by his six-agent network in Norwich, Newcastle, Sussex, Hertfordshire and Surrey.

The terminal is machine programmable by the user, and Basic, Cobol, Fortran and Pascal compilers are available, also OPL, Ontel's version of Cobol. In interactive mode, it is compatible with ICL C03 and IBM 3278 protocols.

Configured around 8085 architecture, integral serial and parallel adaptors allow cluster operations with multiple terminals accessing mass storage units. Datatext is offering a desk-top terminal with disc drive housing two quadruple density mini-diskettes and a daisywheel printer for £5,300.

Barclays squashes the opposition in user tournament final

BRITAIN'S computer professionals proved their skill as amateur sportsmen last weekend in the finals of a year-long squash tournament aimed specifically at computer users.

And with teams from two banks and an insurance company among the last four, they also demonstrated the sort of employer you need if sport is high on your list of job attractions.

Barclays Bank, National Westminster Bank and Hambro Life Assurance joined Lancashire County Council for the final two rounds of the 1981 Wright Line Squash Tournament.

Winners were Barclays, who beat Lancashire County Council three matches to love in the semi-finals and then saw star player Elliot Stuart overwhelm Hambro's Brian Hanson in the deciding match to win the final 2-1 and the championship.

Stuart is a systems analyst and assistant project controller with Barclaycard, and a former England badminton international. He was

unbeaten throughout the tournament.

Wright Line is the US design range of equipment for storing computer media with manufactured and sold in a country by the Carter-Pearce Group. The group launched squash competition in 1980 and has been publicising progress via advertisements in Computer Weekly throughout the year.

"We hoped to get 250 new says Carter-Pearce chairman, Evc. "But there were too many applications that we have changed plans to allow for 500 a complete extra round."

The competition was not until narrowed down to the last four. On their way to the final, the four first choice teams of 12 and fellow analysts Ian Penberth and Bob Taylor, with ne players Neil Winward and Alan Rosedale, disposed of from the Driver and the Licensing Centre at 50000 from engineering group GMA.

In the final Rosedale, for the absent Taylor, was down in his best of five match with Hambro's Ian Penberth, but fought back twice.

Penberth won best of five Hambro's Gordon Golder, first defeat of the champions square the final at one match before Stuart clinched the £50 individual cheque Barclays.

After the final the team given a lesson in real squash British professional chess Philip Kenyon.

Kenyon then became the an impromptu song and dance from Penberth and his wife Alan Rosedale. Suffice it to say that both would find rather fortune through the squash than they would in the match.

The next Wright Line Squash Tournament is to be held in the Details from promoters: 500 Penthouse Suite, Turf Hill, Great West Road, Brentford, Middlesex TW8 9HZ. Tel: 0181 2257. Telex: 934138 ref 5708.



Tournament winners Barclays Hank Stuart (back left) and Ian Penberth, with (front left) reserve Neil Winward and Elliot Stuart.

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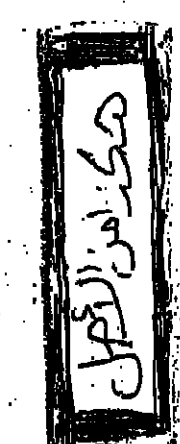
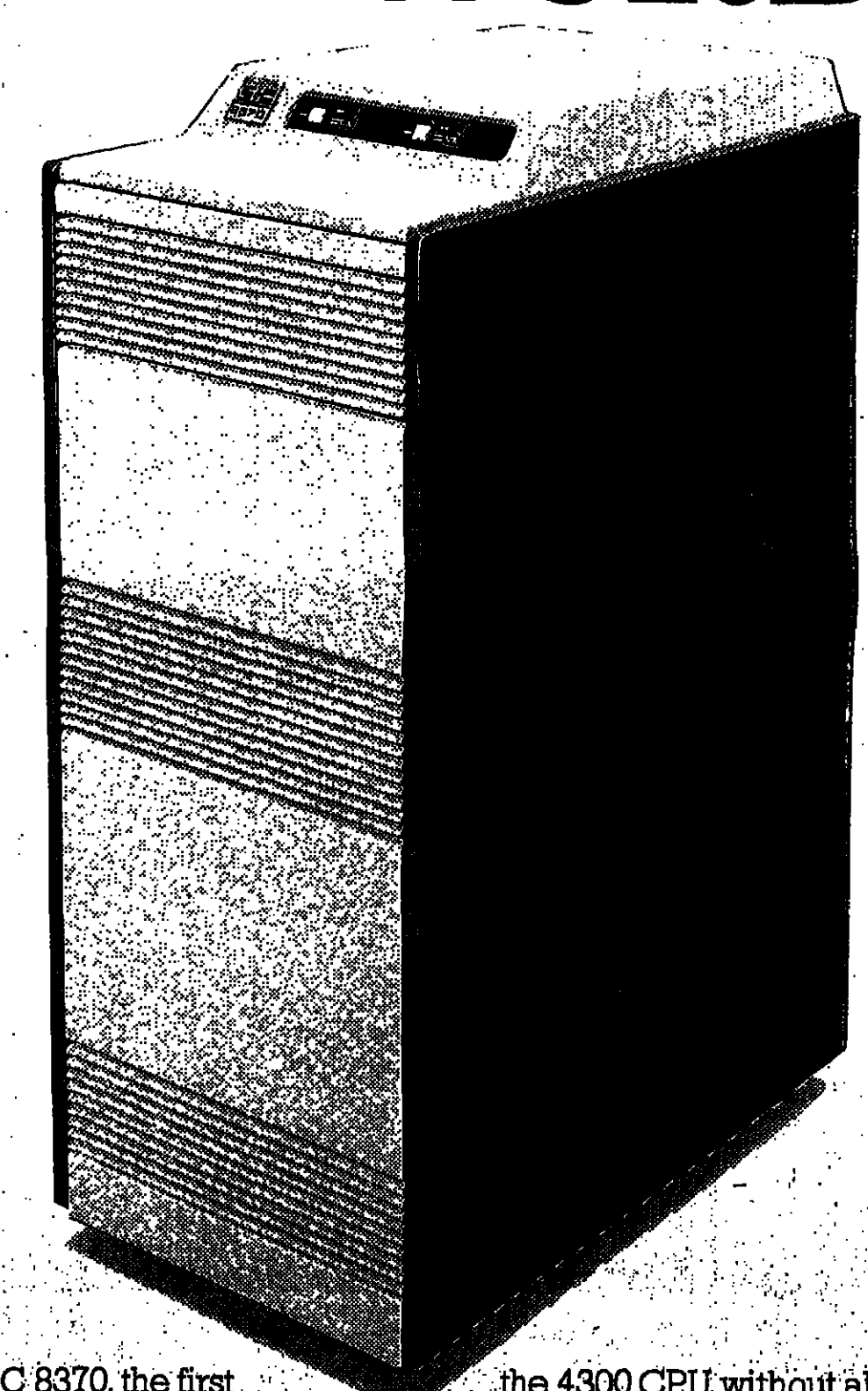
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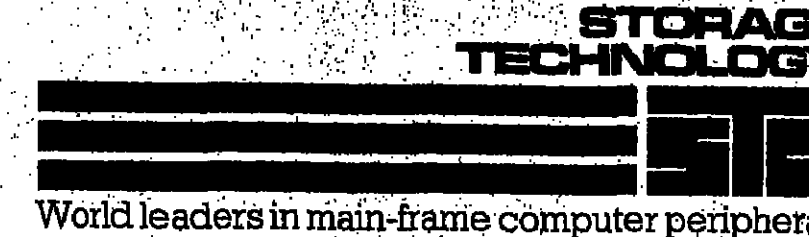
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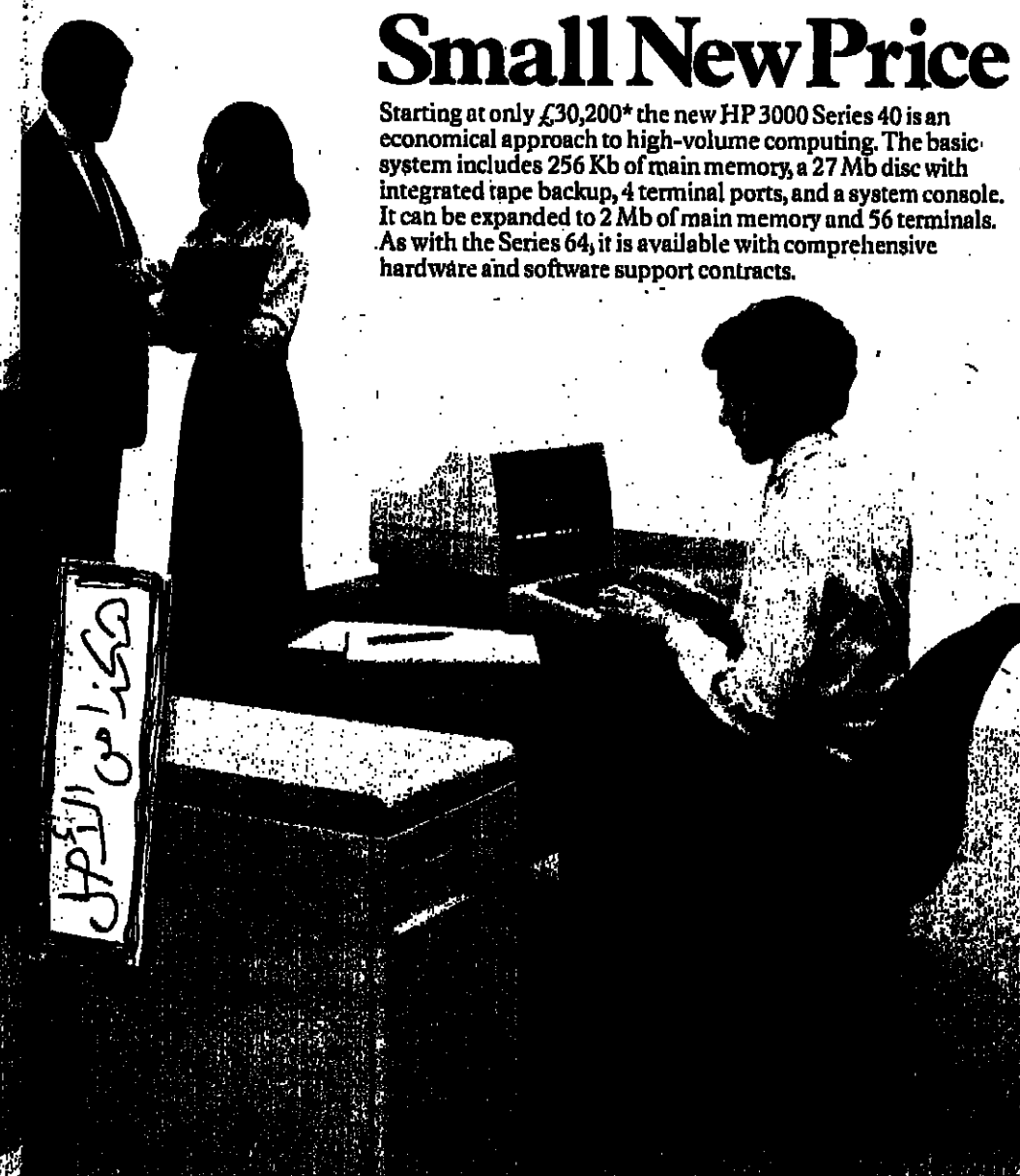
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'Cheap local net has edge on faster systems'

by Donald Kennett

FOR some time to come, low-speed local area networks will grab sales in preference to the higher performance systems such as Ethernet and the Cambridge ring.

This is the view of John Grant, technical director of Cambridge-based design consultancy Nine Tiles Information Handling which has announced a local networking system designed to support communications between computers and terminals at up to 19.2 Kbits per second.

The ring, called Multilink, operates on a single twisted-pair cable, carrying data at 250 Kbps, and users' equipment is connected to it via RS232 interfaces.

Grant believes that the price of about £300 per network interface will give the ring a significant advantage over the much-publicised but expensive systems, while the data rate of 250 Kbps will support a large number of applications for links between terminals and computers.

Grant is lining up subcontract manufacture and distribution deals aimed at having the first systems available by the end of March. Development plans include building a library of routines to run on a variety of attached microcomputers, a filestore implemented on a micro (with a hard disc and a high-speed parallel interface to the network node) and a software system which will support online sales.

order input while producing invoices and packing documents at the same time.

Call set-up and data transfer routines have been running in micros including an Apple II, a Zilog MCZ, a Newbury Newbrain and a Transam Triton to demonstrate the prototype.

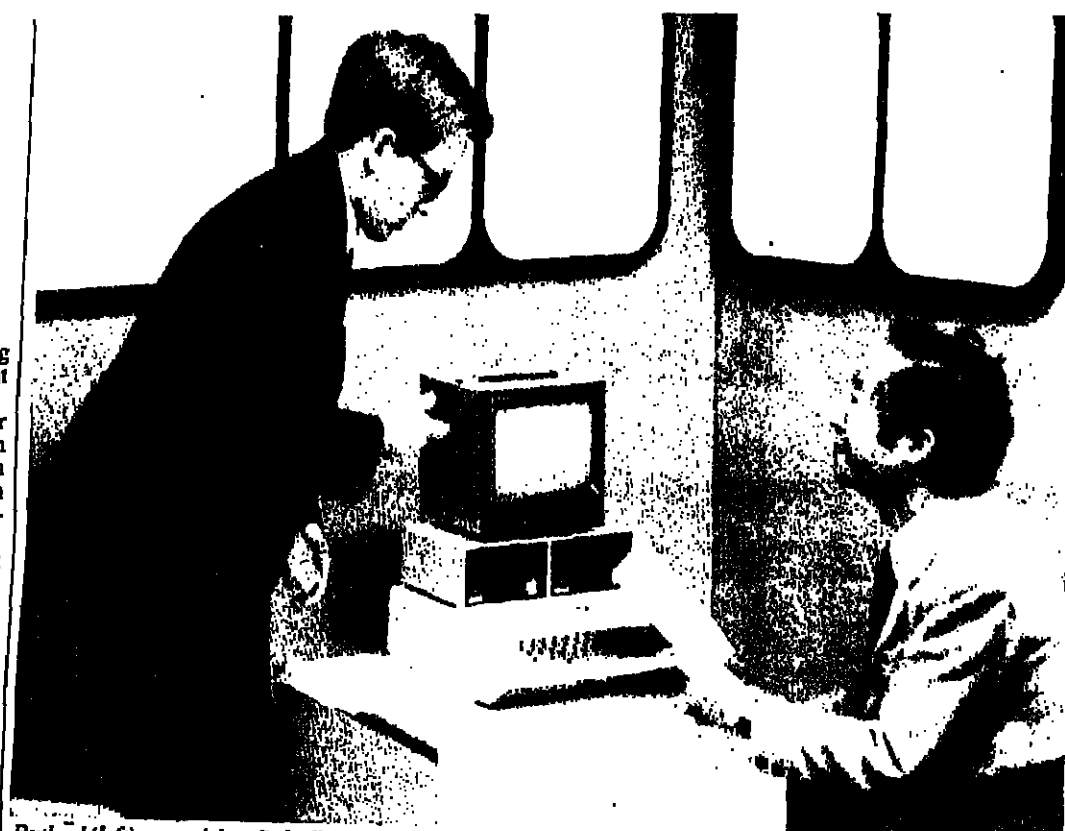
Grant contests the argument that says a 10-Mbps rate is necessary to serve enough applications to stimulate high volume, and therefore cheap production.

"There is plenty of volume at our level of capability," he says. "I am not sure that standards on the ring are so important either, so long as you can make a low-cost device."

"It is in the conversation between the station which sets up the call and the device it is calling that there is a hole in the standards."

"Provided we get enough systems out in the field, we will set a de facto standard there. As we were involved in the production of the Basic language used on the Sinclair ZX80 and ZX81, our software is used by more people than anyone else's. And ICL is talking about making it their standard Basic."

As volume production and the use of integrated circuits bring down the costs of Ethernet, the costs of Multilink should come down too, he adds. "There is quite a lot of circuitry we could put in a ULA. The Americans have done a great deal of talking, but not much in practice."



Butland (left) was quick to find a Japanese agent at a Tokyo conference last year.

Varsity sets up in business

by Maggie McLening

BRADFORD University Software Services, BUSS, a company formed by the university to market an internally developed graph plotting package, is now funding itself from sales. Consisting of ex-full time university staff, the company is led by David Butland, manager of the Simpleplot project, who describes himself as a "sort of director."

"The university is quite pleased to be shedding staff, and at the same time doing something of

value to industry," he explained. Simpleplot Mark 2 offers two-dimensional graph drawing facilities including linear logarithmic and normal probability scales, histograms, and plotting of polynomial functions. It runs on any system offering standard Fortran IV and will drive any graphic device.

A presentation of the package was given at the Information Technology Conference and Exhibition in Tokyo in November. This has led to BUSS finding an agent to

market the product in Japan.

There are currently 120 UK installations with Simpleplot, including British Leyland, the Wellcome Foundation and several local county councils and water authorities.

A Pascal version, Paimpleplot, has also been developed, and BUSS is setting it up on ICL's Perq system.

The price of Paimpleplot is expected to be slightly more than Simpleplot, which costs £900 including one year's maintenance.

NEWS BRIEF

NatSemi profits slump

NATIONAL Semiconductor, one of the largest US makers of chips and integrated circuits, has reported a sharp decline in profits for the last quarter of 1981. Profits slumped to just over \$1.2 million in the six months ended in December from about \$30 million in the corresponding six-month period of 1980. Falling prices and the strong dollar are blamed.

First turnkey

WATFORD-BASED bureau Houser Systems and Technology has sold its first turnkey system, an £88,000 sales order processing and stock control system based on a Prime 2502, to Ima Products. Controls to speed the handling of its 5,000-line product range.

New user group

A USERS' group has been formed for companies with Monotype Communications word and data processing systems. Founding members are Anthony Platt, a assistant registrar of the University of Essex (0206 86286), and Ronald Watson, solicitor of Bedford-based Conquest Clark & Binn (0234 56611). More than half of the nearly 200 users in the UK are said to have expressed interest in joining.

Perq printer

A GRAPHICS printer for the Perq workstation is available following the announcement by the Three Rivers Corp that its interface has been developed. It will manufacture and distribute the Perq in the UK. The desktop plain paper printer is priced at US \$15,000.

More minis

TEXAS Instruments has extended the high end of its DS990 range of minicomputers with three new models - the Models 16, 26 and 36 which use the DS880 and DS990 high-speed large-capacity reprogrammable disc drives, with starting prices of £41,890, £57,320 and £63,800 respectively.

Net processor

ADVANCED Computer Techniques Corp (ACT) has announced a network processor based on a Honeywell Level 6 minicomputer, which may be configured as a remote concentrator, cluster controller or message switch, and may serve as a node for a distributed computing system.

Oil system

OIL refineries owned by Esso, Amoco, Gulf and Texaco are now using a planning and scheduling system from Seicon Computer Services, a subsidiary of BP. Offered as either a service bureau basis, or to run on a user's own computer, the system is written in Fortran for IBM 3033 equipment.

Name change

TYLIN PEOPLE, the Tate & Lyle subsidiary which supplies contract computer staff to DPs and departments in the group and to outside companies, has been renamed TLP. TLP is what is left of Tylin Management Systems, the Tate & Lyle computer bureau which was sold to LA Computer Services.

MICRO NEWS

EEC to provide £24 million for R&D projects

by Boris Sedacca

THE European Community is inviting proposals for research and development projects into microelectronics from companies in member States, and will provide support worth £24 million for 1982, the first year of a programme which will extend over four years.

Projects eligible for aid are direct optical stepping technology, electron beam direct writing on wafers, plasma etching, testing equipment for integrated circuits and computer-aided design for very large scale integration.

The European Community appears concerned that it will be left out of these advanced fields of technology. It relies on imports to provide 80% of a European market for integrated circuits worth about £800 million a year, which means that existing European producers are not big enough to put up the necessary level of investment into

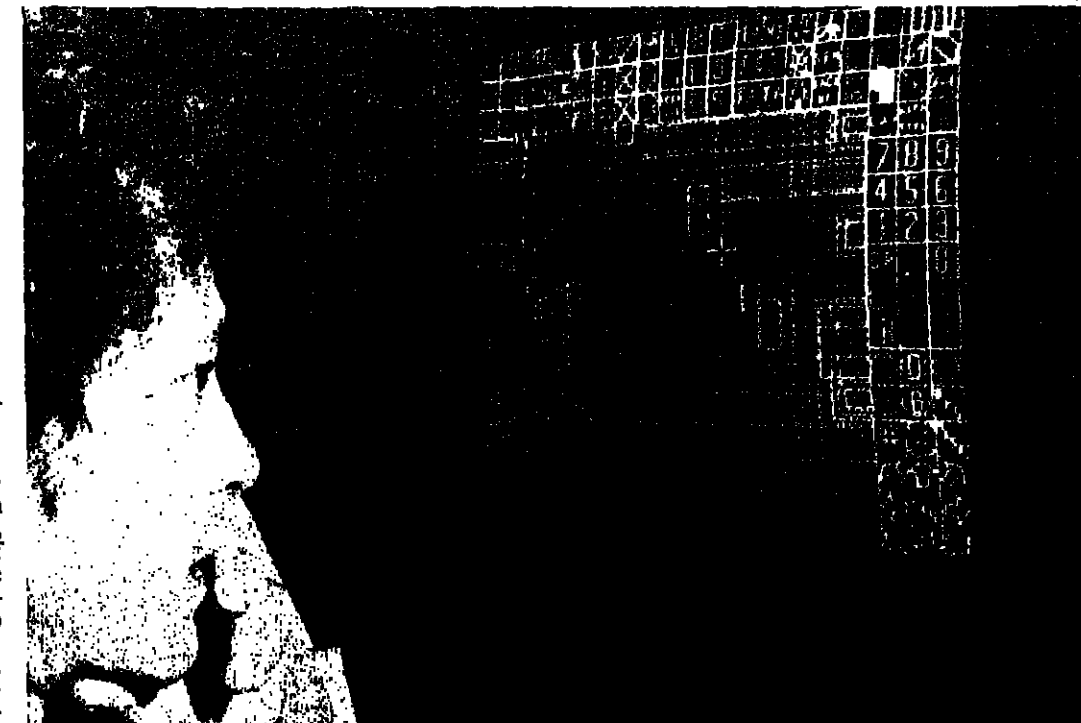
these technologies.

The decision to adopt the scheme was made at a session of the Council of Ministers in Brussels in early December last year.

The scheme is aimed at restoring the balance in the European market for integrated circuits, according to the Department of Industry. Each project will involve firms in more than one Community country, and will apply to both manufacturers and users.

Universities and research centres can also qualify for assistance in the area of computer-aided design for VLSI research and development. Support will normally cover 30% of the cost of a project, but up to 50% support may be granted.

The European Parliament in Strasbourg originally earmarked £30 million for the first year of the scheme with the possibility of member States contributing a



Computer aided design for very large scale integration is among the areas earmarked for support by the EEC.

further £30 million, but no indication has now been given that the full £60 million will be provided.

A spokeswoman for the DoI would not comment on expenditure plans beyond the £24 million committed for the first year.

"We are taking in proposals during the year and decisions will be made by the end of the year as to who gets accepted. The money will then be paid out over the four years of the programme," she said. The European Commission

hopes to raise the member States' share of the world production of integrated circuits to 12% by 1985 - still well below expected European demand, but representing a total sales increase of more than £1,000 million.

Graphics for less than £200

MICROCOMPUTERS can now have graphics features previously associated with costly peripherals for less than £200, according to robotics research and development company Robocom of London.

A hardware and software system, known as Bit Stik, lets microcomputer users create multi-colour graphics quickly and easily on a 48K Apple II. A menu, from which items are selected using the three-axis controller, gives automatic lines, arcs and circles in six colours and four types of line. Text can be positioned at any scale, angle or colour in the drawing.

Interface modules and modified software are being prepared for other microcomputers and pre-drawn symbols, to cover common drawing applications such as electronics, architecture and typography, will be available on disc.

First market

EDUCATION is to be the first market sector to be attacked by Positron Computers of Haydock, Lancashire, with its British-built Positron 9000 microcomputer.

Marketing to educational users will be handled exclusively by Positron's first distributor, Griffen and George, a leading supplier of scientific equipment for education.

"We are very pleased that Griffen has chosen the Positron as the micro for education. It is putting a lot of resources behind the promotion," says Peter Loftus, Positron's marketing director.

He adds that Positron is looking for similar associations in other market sectors.

Ferranti to market gate array designer

by Robert Parry

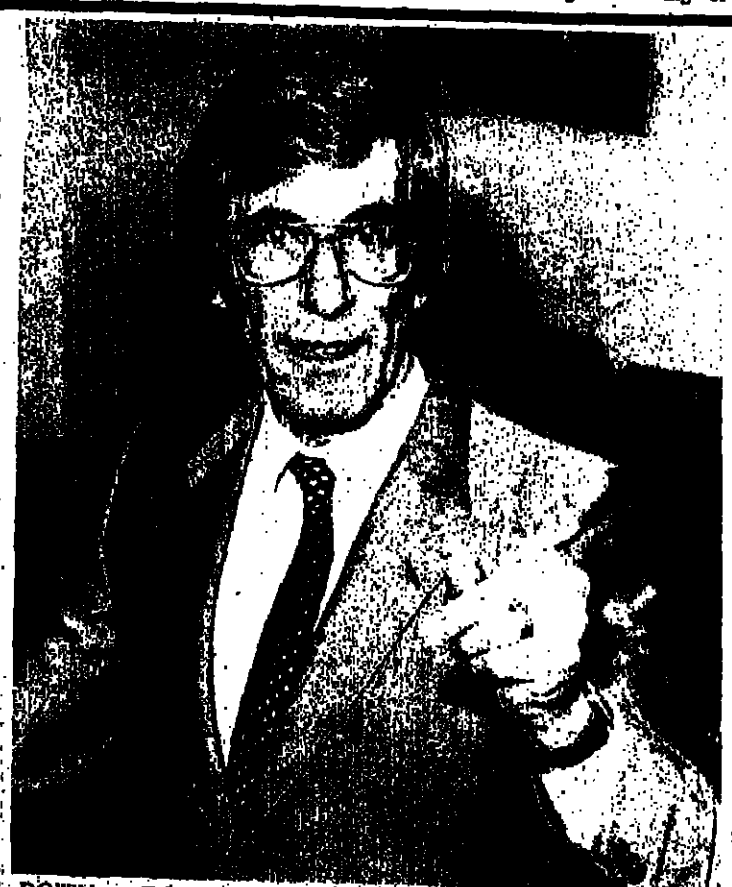
FORTY man-years of effort developing dedicated software for the design and testing of uncommitted logic arrays of gate arrays is to be made available by Ferranti to its customers.

Gate arrays like Ferranti's ULA families provide an increasingly popular route to LSI and VLSI circuits. As the devices become more complex they need more refined CAD tools to design the interconnection that allows the array of logic gates to carry out the required functions.

For an entry price of £37,500, Ferranti's ULA Designer gives complete control over ULA designs right up to manufacture in customers' own premises, while taking advantage of Ferranti's established design software. It is claimed to be the first CAD system designed specifically for the design of gate array circuits.

Hardware is based on a DBC PDP-11/23 mini-linked through telephone lines under DBCnet control, to host computers at Ferranti's Manchester microelectronic design centre or in Scott's Valley, California.

Software allows entry of logic diagrams and cell layouts via a



DOWN: Ferranti has 30% of world market in ULAs.

either, checking syntax of logic descriptions entered and the definition of test programmes.

Using the link to the Ferranti host computer, customers have access to software providing complete design verification, without needing their own large computer system - estimated to cost over \$1 million in hardware alone.

"We are not completely certain how many of these systems we will sell," said marketing director Bryan Down, but he estimated sales of 15 to 20 systems in Western Europe, with a larger number likely in the US. Ferranti sees ULAs as the main part of its business and estimates it has 30% of the world market.

Early retirement hope 'wishful thinking'

by David Craver

THE debate on the implications of technological change - which has put forward early retirement, a shorter working week, the creation of smaller firms, and a shift of resources to the service sector as solutions to technology's social and employment consequences - has been filled with "wishful thinking" and ill-informed assumptions, according to a report published by the Town Planning Department of South Bank Polytechnic.

The report, Beyond Generalisations, is based on a series of seminars held following a 1979 national conference on Planning for Automation which was sponsored by the Gulbenkian Foundation.

The seminars sought to shift the debate from what was seen as the largely business and industrial requirements on which the government has concentrated towards wider issues of general social and economic policy.

Looking at early retirement, the report suggests that even a small

reduction in the retirement age to 62 would entail staggering costs, and would be likely to reduce overall manning levels rather than increase jobs for the young.

In addition, it suggests that one in four of the elderly live on or near the poverty line. For an early retirement to be effective, a large increase in pensions would probably be necessary.

The report also finds no evidence that shorter working weeks have been responsible for job creation. But it does suggest that a shorter working week, by reducing overtime, would increase the number of "low paid" workers by half a million.

The report finds that small firms are "marginal employers, employing marginal labour often in marginal economic activities dominated by large enterprises." As such, they are expected to have little effect on unemployment caused by new technology.

*Beyond Generalisations, Department of Town Planning, South Bank Polytechnic, Wandsworth Road, London SW8 2JZ. 85 pages, £2.00.

Seven programs introduced

THREE new microcomputers are catered for in a range of packages from Systematics International Microsystems. The suite of programs, called Financial Controllers, consists of seven programs priced at £290 each.

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Eric Watson takes over this week's page, and exhorts programmers to take a pragmatic approach to their work

Choose your language with care if Britain is to keep its place

IT is almost impossible to open any computer journal these days without coming across one or more letters or articles either praising some particular, generally new, computer language or denigrating an old one.

The general line followed is to state that the new language facilitates structured programming, presumably in contrast to the amorphous programming which most of us produce, and allows the programmer to do various things in a more elegant way than was possible with the old fuddy-duddy languages.

With respect, I suggest that this is a completely wrong approach. Indeed the slavish adherence to this, essentially academic, approach in the British computer world is probably the main reason why American computing, which was behind us in the late Forties, caught up and passed us in the Fifties, Sixties and Seventies.

In the sterner times in which we live today a more practical approach is needed if we are not to fall even further behind. No one computer language can satisfy all needs, any more than a single type of motor vehicle can satisfy all transport needs.

The lay user will select a language which allows him to start producing useful programs in the shortest possible time. The professional programmer will choose a language to fit the problem and the equipment he has.

Both will, if they are wise, seek languages which enable them to concentrate on their problems, rather than on devising elaborate programs whose purpose, that of producing results, is too often neglected in the search for intellectual stimulation.

In the field of programming, as in most others, it is better to make good use of few tools rather than waste time and effort in acquiring techniques, most of which will

never be needed.

The question of the minimum knowledge which is required before a useful program can be written is, I believe, fundamental in judging the value of a language. It is also one of the most neglected.

In assessing what may be called the "learnability" of any language it is necessary to consider both the verbosity of its statements and the amount of knowledge required before a program can be written at all. Otherwise it would be impossible to make a valid comparison between, say APL and RPGII.

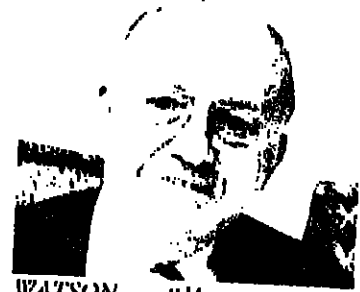
The former, as we are often told, produces programs of quite astonishing brevity. This is true — the amount of pre-knowledge required before any APL program can be written is likely to prove daunting to anyone without a good grounding in mathematical symbolism.

Programming in RPGII, on the other hand, is likely to lead to physical exhaustion, owing to the large amount of textual material to be

entered, the amount of mental effort required being small.

The suitability of any language for a particular user will also depend on the facilities he or she requires. This was recognised in earlier days by the classification of languages as either "scientific" or "commercial". Unfortunately this wholly sensible practice seems to have been abandoned recently in favour of a policy of asserting that the latest wonder language is better in every respect than anything which preceded it.

I would suggest that the time has come when, instead of pursuing this sterile policy, those interested in improving the quality and quantity of computer usage should work towards improving the learnability of computer languages, by cutting out unnecessarily complex constructs, classifying languages precisely according to the fields in which they are most efficient and aiming for conciseness in writing by throwing more



WATSON... "More practical approach needed"

of the work on to hardware, which is cheap, and less on to the humanware which is expensive. What, then, are the steps which should be taken in either choosing or developing a language? I suggest that they are:

1. Define the area of work in which the language is required to be efficient.
2. List the minimum items of knowledge which must be acquired before any program, even the most trivial, can be written.
3. Provide a measure of the verbosity of the language, that is the number of characters which must be entered in order to produce a useable program.
4. List the particular features which the language is required to possess.

The first step, defining the area of work, should not prevent too much difficulty in principle.

The preliminary studies which led eventually to the development of Ada provide a useful example of what needs to be done, although I would not suggest that so detailed and exhaustive an effort is needed in every case. The second step, listing the minimum knowledge which is required before any program can be written is not so difficult as it may appear.

As an initial approach it is useful to consider the classic program which reads in two numbers, adds them together, and prints out the result. In a language such as Basic knowledge of the input and output

statements, the simple addition statement, and the rule for variable names will be sufficient. In Cobol it will be necessary to know the names and functions of the four divisions, while in Algol like languages the whole business of type declarations, procedure beginning and end and nested termination must all be mastered first.

I appreciate that once all this knowledge has been acquired it is possible to carry out all sorts of erudite calculations without need for further factual information. Its novice user who has no need to wish to do these wonderful things. The availability of information of this nature before the user makes his choice will reduce the number of dissatisfied users at help avoid the situation, which happened too often in the past, whereby new features have been cobbled on to a language to suit the needs of those who should have been using it in the first place.

Similar considerations apply to the verbosity of a language. On again the simple addition program will supply a measure of this feature and serve to direct the user to the language most suitable for his needs. The final step, listing the features of the language, is generally done well enough already.

The steps I have suggested will require time and effort. Furthermore they will require more professional approach to documentation of each language than has generally been adopted in the past. This is no bad thing. As to the effort required, I would suggest that this would be considerably less than that currently expended in making huge unsubstantiated claims for many of the languages currently on offer.

The author, who has been engaged on the computer business since 1961, is now an independent consultant with special interest in the evaluation of computer systems.

Cobol quiz answers

HERE are the answers to last week's quiz on the ANSI Cobol standard. The quiz was originally put to visitors to the National Computing Centre stand at the Software Info exhibition held at Wembley in December. Entrants there scored an average 50 per cent, though the winning score was 18 out of 20. No prizes for beating that, I'm afraid.

1. What does Codasy stand for?
Ans: Committee for Deriving a Symbolic Language.
2. When was the first specification of Cobol published?
Ans: 1960.
3. Which standard did ANSI 74 Cobol replace?
Ans: ANSI 68 Cobol.
4. How many reserved words are there in ANSI 74 Cobol?
Ans: 308.
5. How many modules are there in ANSI 74 Cobol?
Ans: Nucleus + 11 modules.
6. Who is responsible for validating Cobol compilers?
Ans: Federal Compiler Testing Centre.
7. Who is currently responsible for the development of Cobol?
Ans: Codasy/Cobol Committee.
8. When was the current BSI Cobol standard published?
Ans: There isn't one.
9. Which one of the following features will be incorporated in the next standard?
Ans: Structured programming.
10. Which of the following is not an ANSI 74 Cobol module?
Ans: PERFORM.

11. In the next Cobol standard what will a transitional language element be?
Ans: An element scheduled for deletion from the following standard.
12. What verb was superseded by INSPECT in the ANSI 74 standard?
Ans: EXAMINE.
13. In the Cobol Metaphor what are square brackets [] for?
Ans: to enclose optional extra.
14. Which of the following is non-standard?
Ans: COMPUTATIONAL-1.
15. What is the highest valid line number?
Ans: 99.
16. Which of the following is NOT a valid data name?
Ans: ABCDEFGHIJKLMNOPQRSTUVWXYZ.
17. Which of the following is a valid numeric literal?
Ans: +4.
18. In the following statement, how many times is ADD-SALES executed?
Ans: 9.
19. Which of the following statements, relating to modules executed by PERFORM and CALL, is untrue?
Ans: PERFORM offers better dependence in its modules than CALL.
20. Which clause does not belong in a SELECT entry?
Ans: LABEL RECORDS ARE STANDARD.

PUZZLER

SOME years ago we had a whole series of divided alphabets appearing in this column, many of them contributed by readers. Here is one I didn't mention at the time.

ABCDEFGHI JKLM PQRS TUVW Y
HI NO S X Z

On which (non-mathematical) basis have the letters been divided? See page 46 solution.

Mitterrand plans to cut Honeywell share of CII-HB—at a cost to taxpayer of \$180 million... Jack Gee reports

Challenge to foreign firms as French set takeover date

NATIONALISATION of the French computer industry is certain to be followed by wide-ranging rationalisation. The watchword of the Socialist government is to put an end to what Industry Minister Pierre Dreyfus calls "Franco-French competition" and to challenge foreign computer makers.

But the French government has encountered a last-minute setback in meeting its January 20 deadline to complete the law-making process for nationalising the computer industry. The Constitutional Council has ruled that the law, as passed by Parliament just before Christmas, is unfair to shareholders in the five leading companies and 36 banks concerned. But it has not challenged the principle of nationalisation itself.

The major computer companies earmarked for nationalisation are CII-Honeywell Bull with its parent company, the conglomerate Saint Gobain-Pont-A-Mousson, Thomson-CSF, and Compagnie Generale d'Electricite.

Matra was taken over at the end of last year by the acquisition of a controlling stake in its equity by the State.

But the takeover of CII-Honeywell Bull is likely to be delayed while negotiations are completed with Minneapolis-based Honeywell which has a 47 per cent holding in the venture. The French government hopes that, after receiving cash compensation, Honeywell will continue to co-operate as both a commercial and

CII and Honeywell Bull, with the blessing of President Giscard d'Estaing who provided a dowry of 1.2 billion francs (£120 million), in subsidies and guarantees of four billion francs (£400 million) in State orders over the next four years.

The objective was to help the new firm become a competitive venture. By 1980 it appeared that the target had been met. CII-HB was making a profit and had doubled turnover, developing new products and generating new jobs. But exchanges of products between CII-HB and Honeywell were steadily working against the French firm. Between 1978 and 1980 CII-HB purchases from Honeywell rose from 423 million francs (£25 million) to 547 million francs (£35 million). Meanwhile CII-HB sales to Honeywell slipped by 232 million francs (£23 million).

Roger Fauroux, chairman of Saint Gobain, was alarmed by this imbalance and the increasing debt load of CII-HB. He and chairman Brulé clashed over Saint Gobain's decision to use Olivetti, in which Saint Gobain has a 30 per cent holding, as a base for developing automatic office equipment. Brulé was told to go.

CII-HB produces the entire range of computers from mainframes to minis. It has seven research centres with a staff of 2,500, factories at Angers in the Loire Valley and Belfort near the German border, and a sales network covering 68 countries.

were turned towards production agreements with the United States. Jean-Pierre Bouyssonnie, chairman of the Thomson-Brandt holding was hoping to make a technological and sales pact for minis with SEL across the Atlantic.

But Industry Minister Pierre Dreyfus has written to Bouyssonnie vetoing the arrangement. Dreyfus' aides say: "What we need now is a coherent development plan based on what French industry has to offer." That means the efforts of CII-HB and Thomson in conjunction with the other half-dozen French manufacturers of minicomputers; but a merger between Thomson-CSF Informatique and CII-HB is not on the cards.

The government intends to invest 600 million francs (£60 million) in the minicomputer programmes of Thomson over the next five years and probably as much as 1.5 billion francs (£150 million) in CII-Honeywell Bull.

Negotiations are also afoot to ensure that Olivetti, with its vast world market network, and Logabax, the French peripherals firm which was rescued from bankruptcy by Olivetti last summer, play active roles in the development of minicomputers and terminals.

The government will give special attention to Matra's computer activities. Matra-Informatique, which specialises in management mini systems, doubled its turnover between 1977 and 1980. It is particularly strong in sales to industrial groups, banks, retailing and insurance firms.

Matra has now branched out into automatic office equipment and into France's electronic telephone directory programme. It is selling 100,000 terminals for this purpose in the US through Tymshare and 1,500 in Brazil.

Another computer technology firm which comes under the nationalisation axe is Transac-Alcatel, a subsidiary of the vast Com-



BOUYSSONNIE... Soon to be replaced.



FAURoux... Unceremoniously sacked.

pagnie Generale d'Electricite. Transac-Alcatel has registered a steady annual growth rate of 25 per cent over the past five years. It is

Europe's biggest manufacturer of automatic bank note dispensers and cash points and has either built or taken orders for 3,500 units. It controls 30 per cent of the French market in smart and transaction terminals, of which it has made 70,000 units.

Nationalisation will be accompanied by a number of top-level management changes in the French computer industry. At CII-HB Maxime Bonnet is expected to be told to step down from the chairmanship and make way for Gerard Thierry.

Thierry headed the French telecommunications authority under President Giscard d'Estaing. Michel Hug, a brilliant engineer who headed the equipment division of Electricite de France, the publicly-owned generating authority, is likely to succeed Bouyssonnie at Thomson.

President Mitterrand, who opened France's National Science Symposium in Paris a few days before the nationalisation process was due to be completed, is promising his encouragement to a revitalised computer industry. He said scientific research, which accounts for two per cent of France's gross national product this year, will rise to two-and-a-half per cent by 1985.

The state's civil research budget will rise annually by 17.8 per cent during this period.

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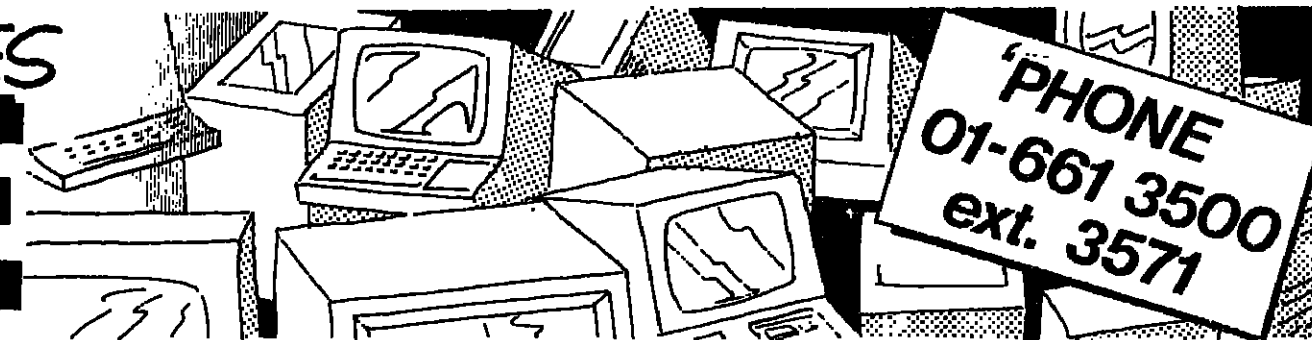
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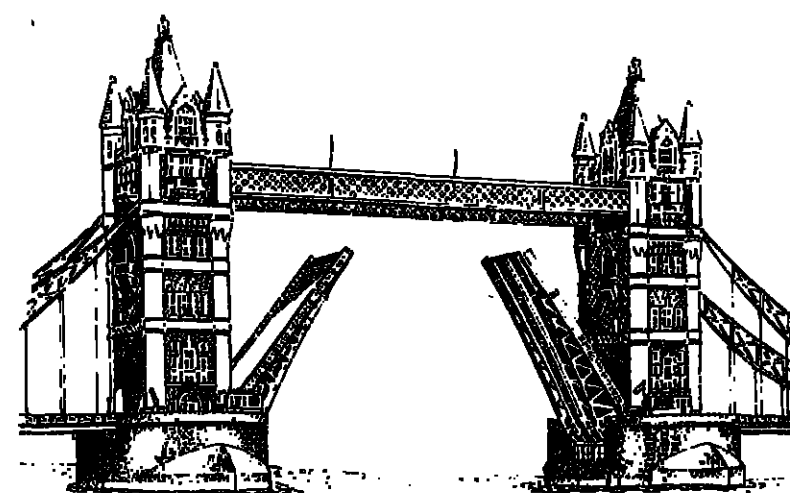
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New project teams are being formed and existing teams supplemented by staff with skills in PL/1, COBOL, CICS, IMS/DB and STRUCTURED PROGRAMMING. Candidates are therefore required to have experience in at least one of these areas and the more senior positions will be responsible for systems design and the supervision of small teams.

Full training will be provided in relevant areas.

Systems Auditors

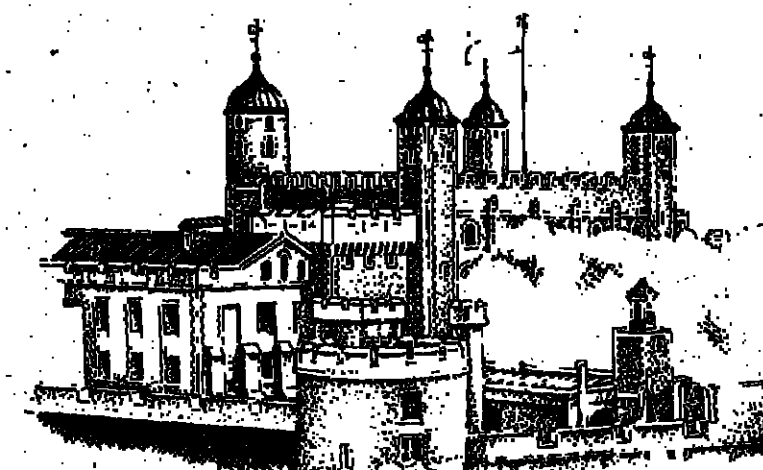
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To join a dedicated team responsible for the quality control of new and existing systems, the persons appointed will be involved in tracking all aspects of project development and implementation. Monitoring test results and ensuring all procedures are water-tight for operational running, these positions will be well suited for persons with analytical minds who wish to expand their DP involvement by co-ordinating all relevant departments.

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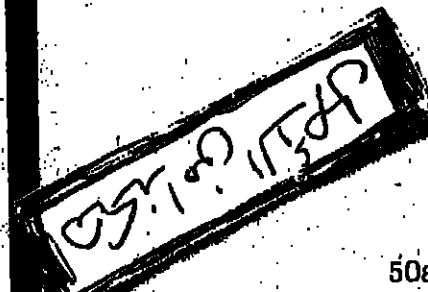
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For further information regarding these vacancies, contact our London office quoting reference **S1/2101.**



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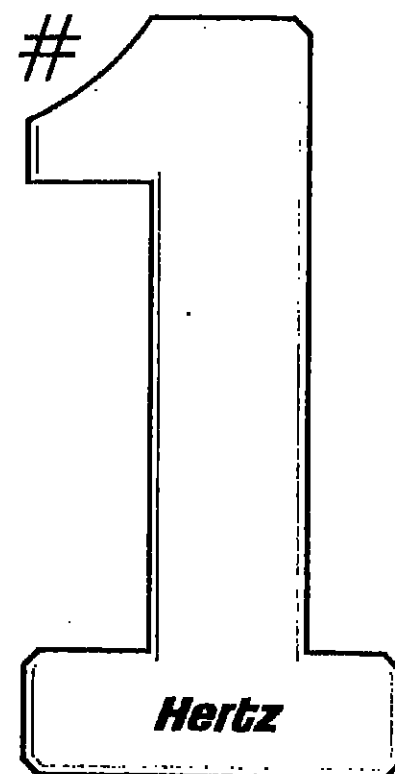
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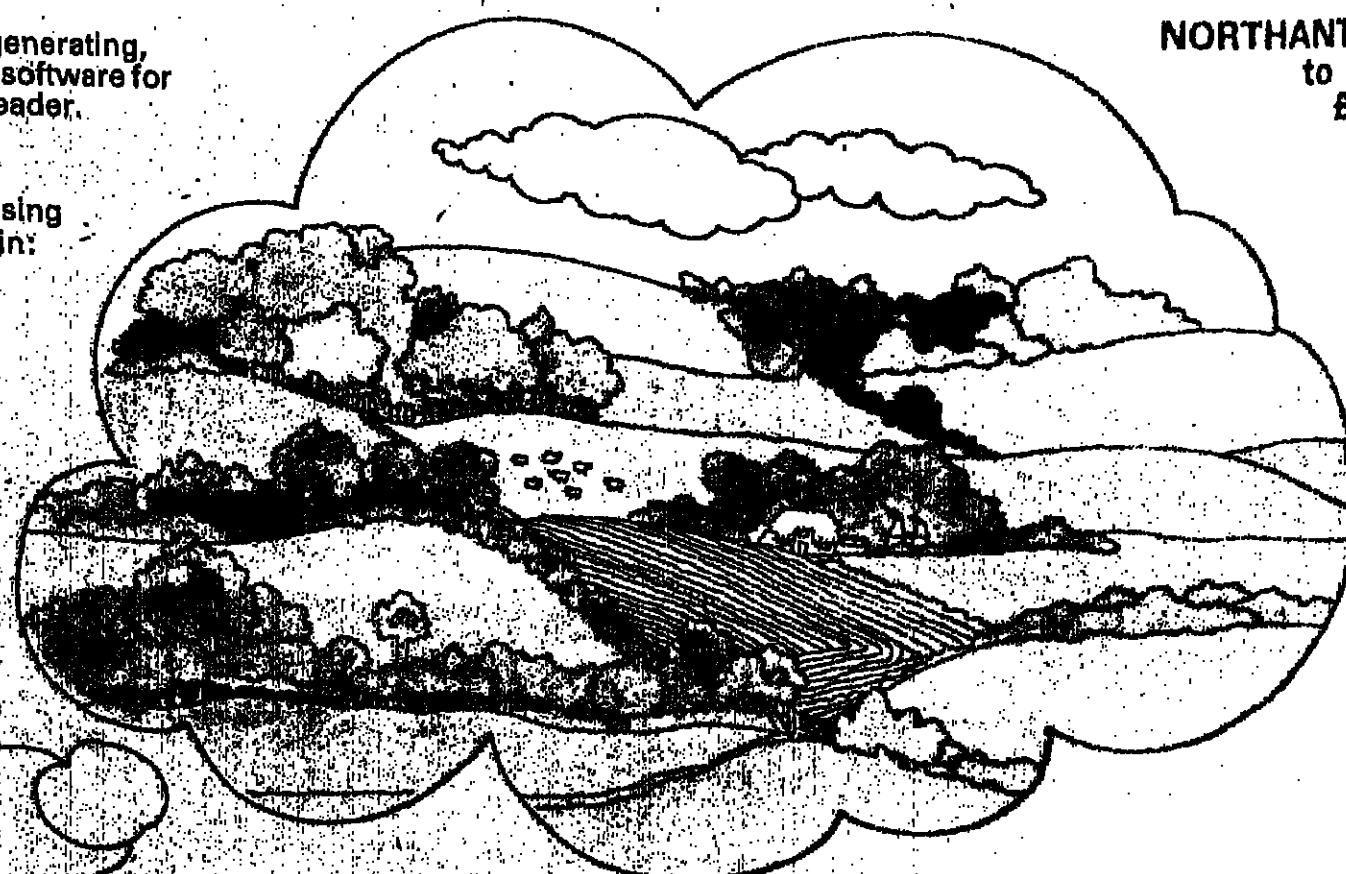
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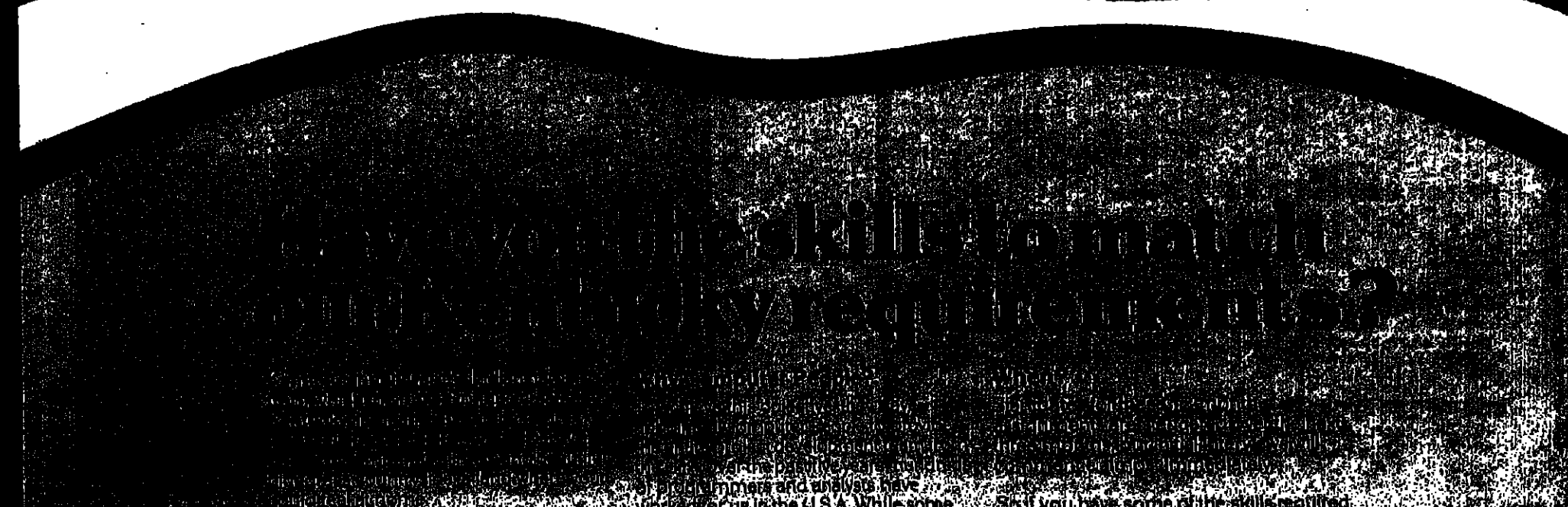
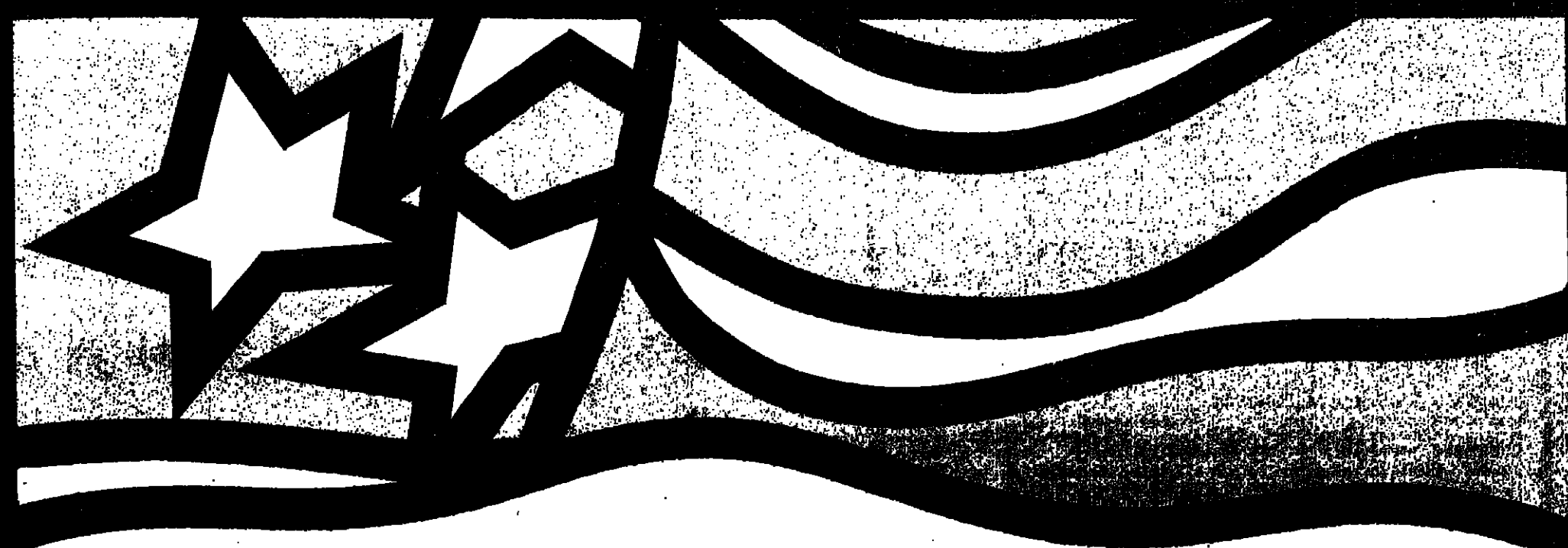
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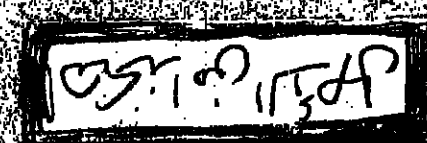
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IBM DOS/VSE - London
Honeywell level 64 GCOS/OS 2000 - Home Counties - as soon as possible
Honeywell level 62 GCOS - London
Contact: **Liz** on 01-836 8411 regarding the above contract positions.

CoOperators

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For further information, please telephone Mrs. A. Hill on 061-499 3355. Ext 3712 or write for an application form to: The Chief Engineer (Projects), Ferranti Computer Systems Limited, Simonsway, Wythenshawe, Manchester M22 5LA.

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tionally, you will have direct involvement in the resolution of both in-house research and customer test problems. You will frequently be required to actively participate in seminar presentations and systems demonstrations. Certain positions will entail a degree of national and international travel, and consequently you should enjoy the combination of high technology involvement and a cosmopolitan working environment. Ref: L3/A

Pascal Programmers

Home Counties: Salary to £11K

A leading supplier of Business and Communications Systems has a requirement for a number of PASCAL Programmers. All respondents, preferably aged 22-30 years, should offer a minimum of one year's post-graduate industrial experience in an environment where PASCAL has been used as the major programming language. You will probably be employed as either a Software Engineer or Junior Applications Pro-

grammer within a systems or software supplier. Our client can offer a number of diverse opportunities within its various operating divisions covering such technical areas as the design and implementation of financial management packages, data communications networking or the development of the home and hobbyist computing markets. Ref: L3/B

Project Leaders

Central London: Salaries to £15K

A world leader in the field of Information Technology and Communications is currently seeking additional Project Leaders. Suitable applicants will be aged 27-35 years and offer a minimum of five years' combined programming and systems development experience gained in either a manufacturer or systems house environment. You should have a detailed knowledge of message/

packet switching, office automation or Viewdata systems. Of particular interest will be candidates who have experience in leading or managing a project team involved in the development of a system from feasibility through to implementation. Candidates who can offer foreign language ability will be offered the opportunity to travel overseas. Ref: L3/C

Jnr. Scientific Programmers

Sweden: Salaries to £14K

Our client, an internationally renowned Systems House, is currently seeking additional Real-Time Programmers for its Swedish division. These positions will appeal to young career-minded graduates who are currently employed in a real-time mini- or microprocessor environment. It is essential that you have a minimum of two years' programming experience, and languages should

include Pascal and Assembler. Particular applications areas of interest are telephony, telecommunications, industrial engineering or process control. As a member of a small project team you will be involved in the design, coding and testing of real-time applications software to meet user specifications. Ref: L3/D

Local Area Networks

London & Home Counties: Salary to £16K

Communications Systems Designers and Real-Time Programmers are required to assist in the development of an advanced micro-based local area network. Systems Designers will have been responsible for the formal definition of the structures and interconnections required to provide shared communications on at least one major, non-homogeneous system. Whilst not essential, familiarity with the I.S.O. reference model

will be favoured. Applicants for the programming positions will be required to have at least two years' communications experience, preferably gained on a packet-switching system. Candidates with a knowledge of X.25 protocol standards will be especially welcome, as will those with practical experience of U.C.S.D. Pascal. Ref: L3/E

Micro Development

Beds/Cambs: Salaries to £10K

A number of Micro Engineers are sought, by a highly regarded microcomputer manufacturer, to join its Research and Development facility. At least one degree in Computer Science, Electrical Engineering or a related discipline is essential and should, preferably, be supplemented by at least two years' work experience. It is anticipated that you will be currently employed by a computer manufac-

turer or a small, specialist systems house. Naturally, an appreciation of hardware design techniques would be an advantage but, more importantly, you should have software skills in either compiler development, with particular emphasis on C and Pascal, or the development of Operating Systems, especially if derived from UNIX or RSX/11. Ref: L3/F

VAX Progs/Designers

London & E.E.C.: Salaries to £15K

A leading International Systems Company specialising in the development and sale of communications software is seeking Programmers and Designers for its Central London and overseas facilities. Suitable candidates should hold a numerate degree and have two years' subsequent programming or systems design involvement. Fluency in FORTRAN is essential and it is preferable to

have had exposure to either a PDP 11/RSX-11M or VAX/VMS configuration. Candidates who are fluent in a foreign language especially French or German will be of particular interest to our client. A degree of mobility is necessary since most positions involve both European and transatlantic travel. Ref: L3/G

Basic Programmers

Berkshire: Pkge to £10K

A long-established Systems and Software House with its U.K. headquarters based in rural Berkshire is currently seeking additional Programmers. Suitable candidates will be graduates with a minimum of one year's industrial experience, preferably in a commercial environment. Fluency in Basic is essential. Whilst exposure to particular hardware is not important, there is a stated

preference for candidates to have worked in a minicomputer environment. You will join a project team engaged in the development of financial packages for end users and computer manufacturers and therefore a knowledge of accountancy would be a distinct advantage. The remuneration package is excellent and includes a car allowance, a bonus and an above-average basic salary. Ref: L3/H

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The successful applicant will join a team of systems programmers supporting the existing software which includes DOS/VSE, CICS, DL1, SNA, VTAM, etc., and evaluating/implementing new packages for the U.K. and six other European countries. Candidates should therefore be prepared for some foreign travel.

The London installation consists of two IBM 4341s, one running under VM. The current plans are to install an IBM 3081 in 1982 and convert all systems to MVS. Full training will be given, making this an ideal opportunity for a DOS Systems Programmer to expand their skills.

£10,000-£13,000

A salary in the above range is envisaged but candidates should not be deterred from applying if their expectations fall outside these limits.

For further information please contact our London office quoting reference number S2/2101.

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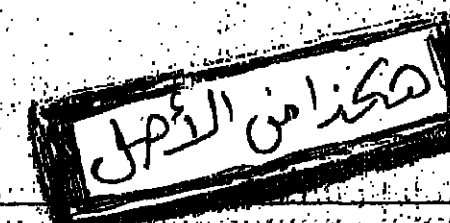
For further details, please phone or write to: John Innes, IAL, Aeradio House, Hayes Road, Southall, Middlesex UB2 5NJ. Tel: 01-574 5432. Please quote the appropriate reference.

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To work on the design of a wide variety of special purpose microprocessor based systems and interfaces. Applicants should have 3 years' experience of electronic control systems primarily based around microprocessors. They must be able to design PCBs and program in assembler.

Microprocessor Software Engineers

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To develop special purpose software for microprocessors primarily in control application areas. Applicants should have 5 years' software experience of which 3 should have been on microprocessors: very bright people with less experience will be considered. Some knowledge of hardware would be an advantage.

Technical Programmers

All Regions ● in excess of £8,000 + car + benefits

To work on software projects in the fields of industrial automation, CAD/CAM, typesetting, data communications and system software. Applicants should have 3 years technical software experience in at least one, preferably two, of the above areas. A knowledge of assembler and one high level language is mandatory.

Industrial Automation Designer

Northern Region ● in excess of £10,000 + car + benefits

To work in the design and development of process control and production control systems. Applicants should have a minimum of 5 years' experience in control systems and knowledge of assembler and at least one high level language such as RTL/2. Responsibility for at least one complete project would be advantageous.

Microprocessor Programmer

Science Park Cambridge ● from £7,500 to £8,500 + benefits

To work on development of microprocessor based advanced text-processing systems. Applicants should have 2 years' experience with at least 1 year of Z80 assembler, CP/M and a high level language. A university degree in computer science and experience of Pascal or C would be advantageous.

Applicants should ideally have a background in Computer Science or Engineering related subjects: should want to tackle advanced technology projects and accept a high level of project responsibility and be prepared to travel on business.

For further information telephone Jenny Dalrymple-Hay or Ian Murray West on 01-493 2947 (day), or respectively Beaconsfield (04946) 4579, Milton Keynes (0908) 563415 (evenings/weekends) or write quoting Ref. 9880

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The person appointed will be responsible to the Area Development Engineer [Systems] for design, programming and implementation of specific development projects. The Section provides a support service to a number of operational engineering computer systems including real-time control, telemetry, communications and other engineering applications using a variety of mini and micro computers.

The successful applicant will be expected to participate in the overall design of those systems and be aware of and keep abreast of the latest changes in equipment and software which may affect engineering computer systems.

Applicants should primarily have computer system development and low-level language experience. A knowledge of CORAL 66, FORTRAN, or PL/M will be useful.

Candidates, male or female, should be qualified to at least HNC level or its equivalent in a relevant discipline. Membership of an appropriate professional institution would be an advantage. A clean, current driving licence is essential.

Salary will be within the range £9,253 - £10,703 and benefits are those normally associated with a large progressive organisation.

Application forms, quoting reference E272A/CW, returned by 5th February, are obtainable from: Personnel Services Manager, Northern Gas, PO Box 108, Newcastle upon Tyne NE99 1GB. Telephone Newcastle (0632) 685882 anytime.

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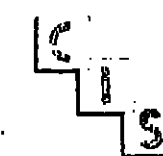
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(1820)

SENIOR PROGRAMMER/ANALYST (DATA PROCESSING MANAGER DESIGNATE)

CAMBRIDGE

Bidwells is a leading firm of chartered surveyors, managing property and farms through the country. Due to expansion and with a software house involvement we have recently installed a Data General Nova 4 System to upgrade and expand systems in our accounts and estate management operations. We now wish to appoint a Senior Programmer/Analyst to head up and expand our computer function.

The successful candidate will be a Programmer/Analyst of at least 5 years' experience and will have developed systems using DG Business Basic. He or she is probably currently employed in a progressive DP environment or a software house, can show a record of successful systems, be self-motivated and able to communicate with assurance with all levels of management.

We consider this to be an appointment which will grow as our data processing needs develop. The position involves a wide range of tasks to ensure the efficient operation of existing systems and to recommend and effect the installation of new hardware and software in other areas of our business. We offer excellent conditions for our staff. Benefits include annual merit bonus. Re-location expenses will be paid. Local accommodation will be provided.

Please apply with full details of age, experience and present salary to:

J. T. Livingston Booth F.C.A.
Chief Accountant
Bidwells, Trumpington Road, Cambridge CB2 2LD

(1820)

Data Communications Network Engineer

The development of the global telecommunications network has led to the requirement for an additional Data Communications Engineer to join the International Operations Department of American Express Corporate Telecommunications Services, based in Brighton.

Key responsibilities will be in an operations support role involving diagnosis and rectification of network outages, liaison with vendors regarding the maintenance and servicing of data communications equipment and some network installation/reconfiguration work.

We are particularly interested in candidates, male or female, with experience of PD, Rascal Micro and Codel Modems, multiplexers and allied devices. Experience with IBM systems hardware and line protocols would be an advantage.

An attractive salary is offered together with a mortgage assistance scheme, non-contributory pension and group life insurance plans. Relocation expenses will be paid, where appropriate.

Please write giving career and salary details, or telephone for an application form to: Mrs. Diana Sharpe, Senior Personnel Officer, Corporate Personnel, American Express L.B.C., Prestatun House, Preston Road, Brighton, Sussex, BN1 6BN. Telephone: 093555 Ext. 3629.

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We require an Analyst/Programmer to further extend and integrate our production control, financial and administrative systems. Applicants should have COBOL experience. Previous experience of production Control Systems and knowledge of Data General CS Software would be advantageous. We are a progressive company and can offer a stimulating background to the right candidate. Salary will be subject to experience and qualifications, but is unlikely to be less than £7,500.

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Situated in the country the installation presently has an IBM 3033 and an IBM 3032 with South Africa's first IBM 3081 being installed early this year. In addition, they have a wide range of mini computers at remote sites. They use the latest software tools, including IMS data base and data communications.

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South Africa has much to offer—a booming economy, sunshine, low taxation and high living standards. The employment package offered by Anglo American is generous, even by South African standards, and includes:

- Top salaries plus a car for senior positions.
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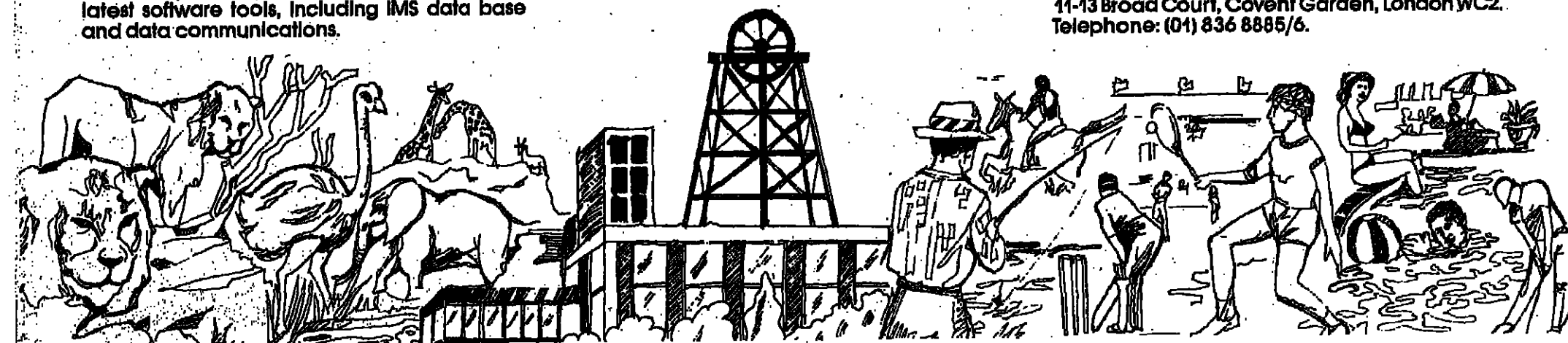
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This is an ideal opportunity to combine career progression, experience in a new country and a real possibility of saving.

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COMPUTER SERVICES

(1877)

SENIOR ANALYST PROGRAMMER £10,000

Do you have the ability to maintain and enhance systems without supervision? In this company you would be working in a small computer department that is in the initial stage of expansion. They currently run an IBM 570 and an IBM 562, and CICS, then this could be an ideal career move for you. Call us for more details.

SENIOR PROGRAMMER £9,500+

Our client is currently developing a large engineering system and requires someone with an excellent background in PL/I, experience in CICS or ISCO would be a definite advantage. Promotion prospects within the company are good, benefits are generous. If you feel you have gained in-depth experience in your present job and would like the opportunity of developing your skills, this is the opportunity you're looking for.

PROGRAMMER NCR COBOL

c £8,000

International financial organisation requires a programmer with NCR Cobol and IMOS experience. Any exposure to IBM RPG11 would be useful. This is an excellent opportunity to join a rapidly expanding D.P. department and become involved in a variety of systems and hardware with the possibility of some overseas travel. Usual banking perks are offered.

JNR PROGRAMMER RPG11

£7,000

Subsidiary of a multi-national corporation require 2 Junior Programmers with at least 6 months commercial RPG11. Excellent career path with rapid progression through to analysis. This is a good opportunity for a skilled programmer to move into a small and professional team.

SYSTEMS PROGRAMMER BURROUGHS ALGOL

c £11,500

A large company whose interests are well known are currently looking for an experienced systems programmer to join their specialist team on a wide variety of applications. A minimum of 3 years' experience utilising MCP and datacomms with the emphasis on datacomms is required with extensive use of algol. Any knowledge of Cobol would be useful. A good relocation package is offered to this site in Surrey. This requirement is urgent.

SENIOR PROGRAMMER BASIC +/-2

£9,500

At least 2 years' Basic+2 with some Basic+2 is required by a large City user. As well as programming ability applicants must be able to manage junior staff. All programming staff are encouraged to gain early involvement with analysis since there are no analyst/programmers.

PROGRAMMERS HP COBOL

to £11,500

Senior and Junior programmers are required by sites in C. London and the Home Counties. Applicants should have from 1 to 4 years' experience preferably gained in an H.P. environment. These positions are with progressive companies offering excellent career prospects and a variety of perks including mortgage subsidy, travel allowance etc.

PROGRAMMER ICL COBOL

c £9,000

Expanding City based installation seeks a programmer with around 2 years' Cobol experience gained on the ICL 2900 range. The preferred applicant will have both on-line and database experience with a good commercial background. The company is shortly installing new hardware and can offer excellent career prospects and perks including a substantial bonus scheme.

ANALYST & PROGRAMMERS DG COBOL

to £11,500

A well-established bureau currently embarking on new projects requires various levels of staff from Programmers to senior analyst/programmers. Knowledge of DATA GENERAL NOVA under ICS is essential for the more senior positions while a good commercial COBOL background would be suitable for the programmer post. Based in Central London, this client offers good working conditions and excellent career prospects.

PROGS & ANALYST/PROGS. IBM COBOL

to £11,000

At the end of 1981 and the beginning of 1982 we have identified numerous and various requirements in the IBM sector. All the sites are mainly Cobol orientated but any PL1 knowledge would be an advantage. One C. London user has recently installed two IBM 4341 machines and now wishes to expand their development team substantially. The posts range from programmers, with 1 years' Cobol, to Analyst/Programmers, with around 3 years' experience. Preference will be given to applicants with some knowledge of CICS or similar real time system although training will be given where necessary. This is a typical C. London requirement but there are many other sites recruiting in other parts of London and the Home Counties.

PROGRAMMERS IBM ASSEMBLER

to £9,000

2 Central London financial installations are seeking to recruit experienced IBM Assembler Programmers to complement their existing teams. Applicants should have a minimum of 1 year's experience and in any commercial environment. Knowledge of CICS would be useful however training will be provided where necessary. Both companies offer secure positions with good career prospects and a wide range of benefits including mortgage subsidy.

This is just a small selection of current requirements. For details of these and others not advertised contact us now.

(1820)

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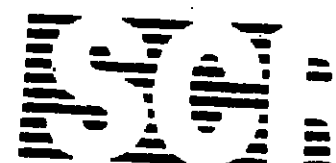
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We are the leading supplier of DEC based systems in South Africa and are enjoying a very healthy demand for our product range within the commercial, manufacturing, and government application areas. Our success has given us a R10 million turnover and we are now sustaining an annual growth rate of 40%. As a result of our product popularity, covering networking, communications and stand alone applications, we are seeking to recruit experienced DEC personnel to help with the installation and development of systems within our Client base. We are particularly seeking DEC PDP 11 and/or VAX experience, together with a good knowledge of RSX 11 operating systems. Our main programming language is COBOL but any experience in ASSEMBLER, CORAL, OR BASIC would be helpful, as would previous networking/comms knowledge. Our facilities are based in the Johannesburg area but our Clients are spread throughout South Africa and travel to sites will occasionally be required. As a well established Company, we can offer an excellent package of salaries and benefits which we will measure against abilities available. We can also demonstrate a high degree of

flexibility in how a remuneration package can be constructed and tailored to suit all manner of personal requirements.

Each Candidate will be assessed entirely on merit, but for guidance around 2 years experience would be worth approximately R20,000 + Car and relocation/travel assistance. Obviously a higher standard of living is available at a much lower cost, particularly with less income tax and purchase tax at only 4%. Consequently a very pleasant 12 months or longer - even permanently if you wished - can be enjoyed in a climate unquestionably more favourable than a British winter or summer!

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Project Leader (Programming)

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To be responsible to the programming manager for one or more programming teams. You must have 2 years experience of managing in an IBM mainframe development environment, structured programming techniques desirable.

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up to £13,000

To supervise a team of programmers in the support, development or enhancement of one or more computer systems. You should have been closely involved in programming for at least 5 years with experience of IBM 370, MVS, IMS, TSO and COBOL.

Senior Systems Analysts

up to £13,000

Applications are invited from Analysts with experience in feasibility studies, systems design and user support.

In addition there are vacancies at various levels for Analysts, Analyst/Programmers, Job Control Technicians and also for Operators with IBM mainframe experience. Why not telephone for further information?

The salaries shown will have given you some idea of our belief in rewarding effort - and there are other big-company benefits, too, including relocation

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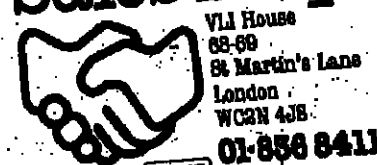
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6 x Analyst/Programmers COBOL, IMS, CICS circa \$35,000

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car transport
pleasant social scene
pay in both UK
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26 x Programmers, Systems Programmers and Database Designers \$30,000 to \$42,000

We are recruiting a 26 person project team for the development and implementation of on-line database financial systems on an IBM 4341 MVS installation in Connecticut. Assignments are for 12 months and we require the following specific skills: MVS, COBOL, CICS, PL/I, DB/VS, DB/2, DB/4, DB/6, DB/8, DB/10, DB/12, DB/14, DB/16, DB/18, DB/20, DB/22, DB/24, DB/26, DB/28, DB/30, DB/32, DB/34, DB/36, DB/38, DB/40, DB/42, DB/44, DB/46, DB/48, DB/50, DB/52, DB/54, DB/56, DB/58, DB/60, DB/62, DB/64, DB/66, DB/68, DB/70, DB/72, DB/74, DB/76, DB/78, DB/80, DB/82, DB/84, DB/86, DB/88, DB/90, DB/92, DB/94, DB/96, DB/98, DB/100.

If any of these positions interest you, Ring Mary Coleman or Lynne Lawes on 01-836 8411 (24 hrs). Interviews with our U.S. clients will take place in the next four weeks.

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Salary to
£10,500

A minimum of 2 years IBM COBOL is necessary to join this totally new installation. The company utilise a new IBM 4341 with an BNA network serving 17 branch offices. Systems are on-line and an extensive database development is under way.

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with team leader responsibility to
£10,500 p.a.

3 years + experience with IBM Assembler and/or PL/I knowledge of technical Systems design of distributed process Systems desirable. Modern offices and first class benefits package.

REF. RP

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City **£8000** + Subsidised Mortgage

Programmers required with a minimum of 18 months commercial experience of IBM ASSEMBLER or COBOL. Full re-training in CICS will be given to successful candidates. Installation comprises 2 x IBM 4341's under DB/VS and Power/VS and making extensive use of CICS and BTAM.

REF. MB

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Croydon **£10,000** + Subsidised Mortgage

The company is part of a major Banking Organisation. They require PL1 and Assembler Programmers of varied experience. The configuration comprises IBM 3031 and 4341, running under DB/VS, DB/2 and CMS are used extensively. The company will train ambitious candidates in ON-LINE and DATABASE techniques.

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● RPGII
● Analysis - MAAPICS
- GFAS

c.£12,500
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The ideal candidate will need previous involvement in analysis to be capable of identifying and solving production and accounts systems problems. The person appointed will take full responsibility for the installation and will report to the Financial Director.

We are a medium sized specialist manufacturing company and part of a major industrial group. As well as offering a realistic salary and normal benefits, relocation assistance is available.

To apply, please telephone 01-686 9693 (24 hour answering service) or write to Nick Foulser quoting ref: CW100-2F at Capp Associates whom we have retained to act on our behalf.

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Please use answering service if necessary

(8221)

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Please send applications, in confidence to:
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(8224)

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pension scheme, free life assurance and 24 days annual holiday. So, if you're educated to degree level with at least 2 years' experience in computer programming/software design with knowledge of real time programming gained in a scientific, engineering or academic environment, then we want to hear from you.

Ring John Kallett on 0202 693535, or write to him at Membran Limited, Fendown Industrial Estate, Wimbome, Dorset, BH21 7PE.

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Applications are invited for the Chair of Computer Science, which has been established in a new separate Department of Computer Science. The successful candidate will be expected to take a leading role in developing the department and to supervise a number of computer science courses in the University. He will also be expected to undertake and encourage postgraduate teaching and research in computer science. The salary will not be less than £15,480 per annum. Applications (12 copies), together with the names of three referees, should be received not later than 15th February, 1982, by the Registrar, The University, P.O. Box 147, Liverpool, L69 3GB, from whom further particulars may be obtained. (Candidates overseas who wish to do so, may send one copy by air-mail. Dupli ref. 87/836/CV.) (8171)

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Applications invited from Mechanical Engineers with experience in microcomputer programming to work with a robotics research group on the design and programming of industrial robots. Candidates should have good honours degree in mechanical engineering and either a Ph.D. or minimum three years' industrial experience. Post is supported by SERC and will be for one year in the first instance. Salary scale 1A £7442-£7847 inclusive. Applications with c.v. and names of two referees to:

Dr. W. K. Taylor, Department of Electrical and Electronic Engineering, University College London, Torrington Place, WC1

COUNTY ENGINEER'S DEPARTMENT

Systems Engineering Section

Applications are invited for the following posts within the Systems Engineering Section of the County Engineer's Department. The successful applicants will join a multi-disciplinary team responsible for the design, operation and maintenance of a number of computer-based control systems, including a large multiprocessor Wide Area Traffic Control System.

SENIOR SYSTEMS ENGINEER

(HARDWARE)
(£8,190-£9,528 p.a.)

Applicants must be Chartered Electrical/Electronic Engineers and have at least five years' practical experience in the design of real-time computer-based control systems. Additionally, applicants should have some experience of C.C.T.V. and V.H.F.-U.H.F. Radio systems.

SENIOR SYSTEMS ENGINEER

(SOFTWARE)
(£8,190-£9,528 p.a.)

Applicants must be Chartered Electrical/Electronic Engineers and/or M.B.E.s with at least five years' real-time system design/programming experience. Preference will be given to applicants with assembler and higher level (Coral 66/RTL2) programming experience within a PDP-11, RSX-11M environment.

Application forms, returnable by 8th February, 1982, and further details from the County Engineer, 2nd Floor, Stearns House, Gilling Place, Liverpool L1 6JW (Tel. 051 227 824 Ext. 2512).

Please quote Ref. 8/70 in all correspondence.

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OVERSEAS VIA I.A.

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2. To write software User Manuals for a new micro processor based development and debugging system, from engineers performance specifications. Applicants, preferably with a Degree or similar in a numerate subject, should show a knowledge of PASCAL, with BASIC or ASSEMBLER and a strong software writing background. Location: The Netherlands Ref: 38/82

DATA ENTRY CLERK/KEYBOARD OPERATOR (or Trainee Programmer) required to edit/input translated screen and print out text etc. Knowledge of modern language(s) essential. Location: Vienna Ref: 48/82

TECHNICAL AUTHORS/TRAINING OFFICERS with a background in Process Control and computer engineering to write the systems documentation for a new Analogue/Digital multi-function mini computer based process control machine, and train users and service engineers on the equipment. A knowledge of hardware and software in such an environment, together with spoken German is desirable. Location: Germany Ref: 58/82

HARDWARE TECHNICAL AUTHORS required to write FIELD SUPPORT, MAINTENANCE and Programming manuals from engineers draft specifications. Applicants must display considerable experience of mini computer peripherals. Location: Germany Ref: 68/82

SYSTEMS PROGRAMMER with 3 to 4 years experience to join an existing team. Responsibility will be held for implementation, maintenance and tuning of all IBM operating systems and software. Hardware is an IBM 4341 running under DOS/VSE. Applicants will have experience of VM/CMS, CICS, with a knowledge of Assembler and Fortran. Location: The Netherlands Ref: 78/82

PROGRAMMERS & ANALYSTS with IBM 4300 running under DOS/VSE experience. Knowledge of COBOL, Assembler, PL/1, Fortran, DL/1 and CICS for various commercial and technical applications. Location: The Netherlands Ref: 88/82

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| Programmers | - IBM RPGII SYSTEM/34 |
| Programmers | - IBM COBOL CICS |
| Analyst Programmer | - IBM COBOL CICS DL1 |
| Systems Analyst | - On-line manufacturing background |

NORTH & SCOTLAND

- | | |
|--------------------|------------------------|
| Systems programmer | - IBM 3031, 3033 |
| Senior programmer | - ICL COBOL VMEB IDMS |
| Systems programmer | - Burroughs 7700, 7800 |

These represent a small selection of the opportunities currently available for permanent and contract staff. For more details on these and a wide variety of other vacancies contact **VAL LACKENBY** on 021-632 5111.



Safe Computing Limited,
Bridge House,
121 Smallbrook Queensway,
Birmingham,
B5 4JP.
Telephone: 021-632 5111.

SAFE
COMPUTING LIMITED

A Member of the Church Group

Department of Computing Services
Three posts are available in the Department of Computing Services which provides a general computing service to the Polytechnic on a DEC2060, PDP11/40 and various microcomputers.

The major languages are FORTRAN, BASIC, and COBOL and major packages include SPSS, NAG, GENESYS and GINO-F.

Chief Systems Programmer

(P01 4-8 - £8991 - £10,928)

to lead the systems team of four which is responsible for the smooth running of the systems software on the central computers. It is expected to appoint a person with at least five or six years relevant experience to this important and demanding position.

Senior

Applications Programmer

(S01-802 - £8190 - £9528)

to join the application team of six which is involved in writing, maintaining, installing and advising on application programs in a wide field of disciplines including engineering, business and science.

Senior Program Adviser

(S01-802 - £8190 - £9528)

to join the advisory team of five which provides the computing advice and information required by staff and students of the Polytechnic.

Further details and form of application available from The Assistant Director (Administration) Trent Polytechnic, Burton Street, Nottingham NG1 4BU.

Forms to be returned as soon as possible.

TRENT
POLYTECHNIC
NOTTINGHAM

UNIVERSITY OF LONDON COMPUTER CENTRE Datacommunication Network Support

The University of London Computer Centre National Centre equipped with powerful systems and providing a computing service to the community in the South of England over both a large area communications links and network types.

An exciting development programme is in progress which includes substantial replacement of existing equipment.

The Network Support Section is responsible for day-to-day operation of this extensive network. The unit includes the identification, analysis, diagnosis and repair of faults in the network, a variety of test equipment and technical aids, computer installations, and the maintenance of administrative systems that contribute to the smooth running of the Section. Installation and commissioning of new datacommunications equipment is also undertaken together with involvement in long term planning.

A vacancy exists at a senior level and applications invited from candidates with a sound technical background in telecommunications or electronics. Candidates should preferably be educated to HNC, HND or degree standard, but other comparable qualifications will be considered.

The starting salary will be in the range of £20,000 p.a. approximately depending on age, qualifications and relevant experience.

Application Forms are available from:
The Assistant Secretary, ULCC, 20 Gifford Street, London WC1N 1DZ. Telephone No. 01-405 9801.

Applications close 6th February 1982

ANALYST PROGRAMMER DORSET - With sole responsibility for systems and programming

South Western Farmers is a successful farming company with an annual turnover in excess of £30 million operating in Dorset, Devon and Somerset. We are currently the process of implementing a number of major investments on our Datapoint 6800 based at Dorchester. These systems include sales invoicing, stock receipt, inventory control and management reporting as well as client systems using terminals to help install and develop an Analyst Programmer to help install and develop these systems and to provide guidance and assistance to the senior staff on all aspects of computerisation.

Applicants will probably be 24 years plus and have held systems and programming experience, preferably in the mentioned above. Although the position is based at Dorchester, some local travel will be required during the implementation of these systems.

Please write, enclosing a CV giving brief details of experience and present salary to:

THE FINANCIAL CONTROLLER
South Western Farmers Ltd
Unity Chambers, Dorchester, Dorset, DT1 1HQ

TESSIDE POLYTECHNIC
COMPUTER CENTRE
Tesside Polytechnic is the forefront of computing in education. The Computer Centre has a staff of 10 and operates a large Olivetti mainframe and a PDP 11. Applications are invited for the following posts:

SYSTEMS PROGRAMMING MANAGER
Reference Number P CU 22
This is a day post involving both management and technical responsibility, with duties reporting directly to the Head of the Centre.
Salary: £11,250 - £13,400 per annum

PROGRAMMER ANALYST/SENIOR PROGRAMMER ANALYST (2 posts)
Reference Numbers P CU 23 and P CU 24
One person to join the Graphics and Communications Group in developing and supporting graphics and communications software.
The person to join the Operating Systems and Computers Group in developing and supporting systems software for either the Olivetti or the PDP 11.
Salary, according to qualifications and experience will be on the following scale:
Senior Programmer Analyst: £13,500 - £17,000 per annum
Programmer Analyst: £11,250 - £13,400 per annum

Applicants should send their curriculum vitae and three recent photographs to: The Assistant Secretary, Tesside Polytechnic, Bournemouth Road, Bournemouth, Dorset, BH1 2BA. Telephone: 01202 71111. Closing date for applications: 26 February 1982.

NEW COMPUTER DEVELOPMENT PRESCRIPTION PRICING AUTHORITY NEWCASTLE UPON TYNE

The Authority is developing a Computer Pricing and Information system capable of processing and analysing 350 million National Health Service prescriptions received each year for more than 10,000 contractors. Currently 2,000 staff are employed to process this work manually in nine centres situated in the North East of England.

The existing Computer Division is expanding its staffing to undertake the purchase and implementation of 1,500 data entry terminals, 8 Mainframes, and the Computer Pricing System throughout the nine centres.

The first delivery of Hardware has recently been received and includes a Honeywell Level 84/DPS - 4 computer, using COBOL.

We require:

SYSTEMS DESIGNER/ PROGRAMMERS

(Procurement and Applications Programming)

Salary scale £6884 - £2147

Subject to certain conditions and previous service on a temporary basis in Newcastle Upon Tyne but some travelling may be required.

Application Forms and Further details are available from the Personnel Office, Prescription Pricing Authority, Bridge House, 100, High Street, Newcastle Upon Tyne, NE1 1BB.

Closing date 26 February 1982

ROCON LTD

is a national account dealer for Apple Computer UK Ltd and a Level 1 service dealer, marketing the world famous Apple II and III personal computer systems. In addition, Rocon Ltd is a dealer for many of the peripherals associated with Apple and has hardware and software departments offering the customer a complete service ranging from in-house maintenance through to tailored software. Due to expansion, Rocon Ltd are currently seeking successful self-starters in the following fields:

SALES

SALES MANAGER, preferably with experience in the microcomputer or associated industries. The salary package is made up of a good basic plus commission and car expenses.

SOFTWARE

SENIOR PROGRAMMER with the proven ability to control a project from the initial feasibility study through the design phase to the user program. Past experience an advantage. Salary negotiable according to experience.

There is also work available for freelance programmers with the relevant experience.

HARDWARE

ENGINEER with experience of microcomputers and peripherals. Driving licence required. Salary negotiable according to experience.

Applications providing details of qualifications and career to date should be sent to: K. J. Rosenfeld, Managing Director, Rocon Ltd, Redley Road Industrial Estate, Abingdon, Oxon.

TOP RATES

DOS COBOL/CICS
HP 3000 COBOL
UNIVAC COBOL DMS

MONTREAL ASSOCIATES SYSTEMS
01-553 2944 (4 lines) Emp. agy.

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CLASSIFIED
ADVERTISING USE

DIRECT

LINE
01-561 0121

Account Manager Education/Government

c£17,000 + on Target

In less than a decade Hazeltine have become a leading manufacturer and supplier of high technology terminal products, enjoying a level of business achieved by few in this highly competitive industry. Our extensive product range and expertise in terminal technology have provided solutions to a host of varied environments, and continue to answer the problems of the eighties and beyond.

A particular area of success has been the education and government sectors, and it is for that market place we wish to retain the services of a highly skilled Senior Sales Executive.

Ideally you will be 28/35, and with a successful sales track record; where experience of negotiation within the education and government sectors is desirable; you should also reside within commutable distance of our Middlesex H.Q.

Additionally to the on target remuneration of £17,000, there is a most attractive car scheme and range of fringe benefits.

For further information and immediate confidential interview, contact our Advising Consultant, Chris Fry on our London number, 24 hour answering service and 05827 2354 evenings and weekends.

SA

Specialist Computer Recruitment Ltd

London 01-935 0871 James House, 46 James Street, London W1
Birmingham 021-236 3761 35-37 Great Charles Street, Queensway, Birmingham B3 3JY.
Manchester 061-633 6427 Blackfriars House, The Paragon, Manchester M3 2JA.
Brussels 010 322-840 7151/71 Avenue Louise 327, Boite 4, 1050 Bruxelles.
Amsterdam 010 3120-780497 Willemsparkweg 82, 1071 H.M. Amsterdam.

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1982 - 20th
ANNIVERSARY

KODE

- HIGH BASIC SALARY
- QUOTA EARNINGS £20K
- COMPANY CAR
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- ADVANCEMENT TO MANAGEMENT
- NEW PRODUCTS

THE OPPORTUNITIES

These are genuinely exceptional opportunities for experienced and professional sales people to join an exciting and developing company offering real potential for rapid advancement into regional and branch sales management. To begin with, you would need to apply your experience and sales expertise in your own designated territory, selling the KODE range of Distributed Processing Systems in both Public and Private Sectors.

You absolutely must be of very high calibre, hard-working, well trained in modern sales techniques and capable of fulfilling sales functions including: client prospecting, client surveys, giving presentations and demonstrations, preparing sales proposals and closing the business. Full training in the KODE product range, market orientation and company history will naturally be given, during a four week training programme at the KODE LTD UK Headquarters in Calne, Wiltshire.

If you are successful in this appointment, in addition to potentially very high earnings, you will benefit by the numerous new senior sales opportunities becoming available following an imminent major new product launch and enhancement of the KODE product range.

YOUR NEXT MOVE

We would like to hear from all sales people who believe they have the qualities, experience and ambition necessary to capitalise on these opportunities. Our immediate requirements are for people to cover LONDON AREA and NORTH OF ENGLAND TERRITORIES, but due to our expansion plans we want to hear from you wherever you are.

Please contact me at my office below by telephone or in writing, or call me at home, evenings or weekends on 06845 2210, by transfer charges. If necessary, interviews will be held in Manchester, London, Worcester or Calne.

staveley
recruitment
staveley computing centre
blackpole road, worcester,
WR3 8TH. telephone
worcester (0905) 53335

KODE LTD Capital Equipment Division of

KODE INTERNATIONAL Limited
KODE LTD, formed in 1962, and now celebrating its 20th anniversary, occupies a modern factory in Calne, Wiltshire. KODE products are marketed by KODE LTD and are maintained by KODE SERVICES LTD. Both companies are wholly owned subsidiaries of KODE INTERNATIONAL LTD, which is a British Public Company and quoted on the London Stock Exchange.

KODE LTD, design, develop, manufacture and market an extensive range of data processing, data entry and terminal equipment. The product range encompasses the XL20 and XL40 range of Key to Disc Data Entry and Distributed Processing Systems, Data Transmission Terminals such as Teletypes and Videot Display Terminals, Winchester Disc Sub Systems and Data Communications Products.

KODE products are supported in the field by an army of over 140 KODE SERVICES LTD technical support specialists and engineers, based at centres throughout the UK. In addition to providing a nationwide maintenance service, KODE SERVICES LTD provide rental and leasing finance for equipment supplied by KODE LTD. KODE equipment users include Government and Local Authorities as well as many 'Blue-chip' companies in the Private Sector.

EXCELLENT CONTRACTING OPPORTUNITIES

Our immediate domestic and international consulting needs are detailed below. If you are of a professional disposition, skilled and dedicated, and wish to join our growing permanent or contract staff, please contact us in respect of these and future opportunities.

International

MARK IV Consultants and Programmer/Analysts Analyst/Programmer

SYSTEM 34/38 New York

FORTRAN FOCUS New York

COBOL HP3000 Africa

ADABAS Middle East

IBM, DOS/VS, New York

POWER, VS, CICS New York

COBOL, CICS Middle East

and or DL/1 New York

UK

MARK IV London

REDIFON Home Cnts.

ADABAS Scotland

VME/CMS London

PRIME/FORTRAN Home Cnts.

COBOL, IMS/DB Home Cnts.

COBOL UNIVAC Essex

1108 Home Cnts.

IBM 370, MVS Home Cnts.

For more information please contact:

Resources Department

TANGENT COMPUTER SERVICES

102/108 South Street

Romford, Essex

Tel: Romford (0708) 750201

(24 hour answering service)

IMMEDIATE CONTRACTS FOR PROGRAMMERS

PROGRAMMER MIDDLE EAST/PRIME/COBOL
PROGRAMMERS FAR EAST OR FORTRAN
MIDDLE EAST IBM IMS
DB/DC
PROJECT CROYDON IBM COBOL
LEADER VM/CMS
ANALYST/PROGRAMMER CROYDON DEC DIBOL
PROGRAMMER LONDON RSTS/E
IBM SERIES 1
EDX
ENGINEERING APPLICATIONS
IBM
SYSTEM 34
RPG11
IBM
IMS
DB/DC



For further details contact Nic Poland
 TLP
 A Division of Tate & Lyle Industries Ltd.
 Leon House, High Street, Croydon CR9 3NH
 01-880 2323
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(8227)

PROGRAMMERS

Move into communications!
HERTS & KENT £8,000-£14,000

If you have the interest and talent to help maintain our client's standards of excellence in the fast expanding field of communications technology you could benefit from:

- a technically stimulating career and the challenge of formulating microprocessor-based communications software using AMDAHL V7 and IBM 4300 host processors
- excellent training, including PL/I if you have not previously used this language
- plenty of scope to progress upwards and/or widen your computing expertise - as you would expect from a leading international company developing a diverse range of advanced technology products
- an informal working environment in first class modern offices
- a substantial increase in earnings - salaries are above average and range from £8,000 to £14,000 depending on experience
- generous relocation financial assistance that will appeal to the first time buyer as well as those who want to increase the size or improve the quality of their homes.

There are openings at various levels at our client's offices in Kent (bordering SE London) and South Hertfordshire.

We would like to hear from programming enthusiasts who have at least two years' practical high level language experience (technical or applications orientated) - and who have the desire to be at the forefront of communications software technology.

Please ring us for a talk, quoting reference 681CW, or leave a message on our answering machine after hours.

(0190)



EDP SYSTEMS 01.637 5796
 52-53 Margaret St. London W1N 7FF

Systems Programmer

Staines Middlesex
c.£11,500

Our client, United Glass, is looking for an experienced Systems Programmer to implement and support software on the growing IBM 4341 installation which provides batch and on-line processing.

Software used includes OS/VS1, VM/CMS, CICS, DL1, Roscoe, Elias, MelaCOBOL and other packages associated with a dynamic computer installation. Conversion to MVS and VTAM are under consideration.

The successful applicant will need to have had at least 2-3 years experience of OS/VS1 or MVS plus a good knowledge of CICS/DLI.

The job will present an excellent opportunity for an individual with drive and self-motivation to increase software skills and expertise and take supervisory responsibility.

The remuneration package includes free BUPA, Life Assurance and generous relocation expenses where necessary.

For further information please write or telephone (24-hour answering service) quoting ref: CW101-2P

CAPP ASSOCIATES
01-686 9693

Capp House, 96d South End,
 Croydon CR9 3SD
 Computer and Professional
 Personnel Consultants

(8213)

Customer Training Engineer

Data Communications c.£10,000+ car

Data Logic is probably the fastest-growing systems group in the UK. Our Data Communications Division is looking for a suitably qualified electronics professional to provide in-depth training for our customers in the use of our modems, multiplexers and especially network management systems. Based at our Marylebone Road headquarters in London, you will operate throughout the UK.

We are looking for a man or woman who is currently working in pre-sales support or field service engineering, or is running data communications networks on the user side. Whatever your background, it is essential that you can demonstrate the ability to keep pace within a marketing-oriented group with a growth rate of 50% per annum.

The successful applicant will be qualified to at least ONC level, in electronics engineering or a similar discipline. HM forces qualifications will also be welcome. Full training will be given on Data Logic products.

The salary is supported by a wide range of benefits. Write with full career details, or telephone for an application form to: Anni Fortescue, Personnel Officer, Data Logic Limited, 29 Marylebone Road, London NW1. Tel: 01-486 7288.



Towards the total system.

(8223)

THE UNIVERSITY OF LEEDS SYSTEMS ANALYST AND COMPUTING ASSISTANT (PROGRAMMER)

An experienced Systems Analyst and an experienced Cobol Programmer are required to join a small team of analysts and programmers working in the Administrative Computer Unit. This Unit currently maintains an interesting range of batch and on-line systems on an ICL 2904/50 and new on-line work is being achieved. For either post experience in an environment including minicomputers or large on-line mainframes would be equally valuable. The starting salaries are at an appropriate point on the UA and IB scales for Administrative Staff according to age, qualifications and experience. These ranges are £2205-£10,625 for the Systems Analyst and £2,205-£5,825 for the Programmer. The Programmer post will be a permanent appointment, whilst the Systems Analyst will be appointed for a fixed term of three years. Written applications from either sex, should be sent to the Registrar, The University of Leeds, Leeds LS1 5LT, quoting reference number 110/23/A2 by 15 February 1982. (8111)

HELP THE AGED
 The major national charity for the old requires a full-time Programmer/Analyst to develop its Management Information System. **COBOL BASIC**
HONEYWELL SYSTEM
 The successful applicant will take full responsibility for the installation after 6 months. Send c.v. to Help the Aged, V.C. Henderson, 12 Station Road, Uxbridge, Midd. UB8 3PH. (8211)

10% FALL IN MORTGAGE RATE

It is forecast that 1982 will result in a massive reduction in house purchase repayments for over 500 computer professionals entering the world of banking and finance.

The Financial Community is adopting more and more complex computing techniques which have brought demands for increased manpower. "We are stretching the boundaries of computerized financial management and we need capable and ambitious individuals to develop their expertise along side of us" said a Technical Support Manager of a major bank.

Large scale development projects, powerful new hardware and versatile software packages are all part and parcel of the plans leading up to the mid eighties. DPMs must recruit the men and women to support and initiate these technical advances.

The benefits are self evident. Highly competitive salaries are complemented by preferential mortgage schemes which can be worth over £2,000 p.a.

To cite a few examples: A leader in Assurance in Middlesex wants to meet Systems Analysts with 2 years' experience and some programming background on IBM. On-line experience would clinch a deal around £9k+ mortgage.

IBM Systems Programmer to join one of the most famous and respected companies in Britain. MVS is essential. Believe me they have a great package. City based.

Major British Clearing Bank is shortlisting applicants for the position of Chief Systems Analyst. The right person will have management experience and the energy to shoulder the responsibility of extensive development work. Salary £14k+ mortgage.

A major Clearing House in the City is seeking experienced IBM Assembler programmers to involve themselves in development work. A CICS background would be a big plus but training would be given. c£8k+ mortgage.

An International Bank needs RPG11 System 34 programmers with 2 years' experience to join a team involved in development and first-line support. Salary to £11k+ mortgage.

The EDP Audit department of an international Bank is seeking a senior Systems Analyst to be responsible for new and existing systems. Salary c£11k+ mortgage.

A Systems Analyst with ICL 2900 experience operating under VMEB is urgently needed by an established Assurance Company in London. Salary to £10,000+ mortgage.

If you feel you have the potential to succeed in the financial community, regardless of whether you match the above specifications, give Richard Smuts at IPP a call on 01-938 1804 to chat about how the banks can work for you.

Information Processing People, Specialist Recruitment Consultants, 20 Kensington Church Street, London W8 4EP.

KPG REQUIREMENTS

CONTRACT

IBM OS, MSS JCL WRITERS
 IBM DOS/VSE/VM OPERATORS
 IBM DOS/VSE/VM JCL WRITERS
 IBM OS, VS1 VM/CMS EXEC & JCL WRITERS
 BURROUGHS 8800/7700 OPERATORS
 UNIVAC 1100 OPERATORS
 ICL GEO-3 OPERATORS

Contact: MIKE PALMAN or
 GARY TOTTEN

PERMANENT

IBM SYS 34 OPS. BERKS
 IBM MVS JES2, ALL LEVELS, MIDOX
 ICL ME29 OPERATOR, ESSEX
 IBM VS1/VM OPS, SUPERVISOR, ESSEX

ENEG
 EHIG
 £8K+
 £8K+

Contact: STEPHEN GREEN
 KPG COMPUTER SUPPORT SERVICES LTD.
 CORDEN HOUSE, PARK LANE
 RICHMOND, SURREY TW9 2RA

01 948 5922

CANADA DATA PROCESSING PROFESSIONALS

opportunities in the Province of ALBERTA

OUR ORGANISATION

Alberta Government Services is the central Data Processing facility for the Government of the Province of Alberta. As one of the largest computing facilities in Western Canada, our systems services include new development, maintenance and enhancement activities associated with the challenging applications of our clients.

Our Computing Centres operate an IBM 3033AP, an IBM 370/168MP and AMDAHL V8 under MVS/JES2, and an IBM 3033S. The configurations support a network of more than 900 terminals throughout the Province. Software includes COBOL, MARK IV, LIBRARIAN, CICS, TOTAL ENVIRON 1, ADABAS, IDMS, TSO CMS AND COMPLETE.

OUR REQUIREMENTS

If you have applications systems experience, we invite you to consider one of our challenging positions as an Intermediate or Senior Programmer/Analyst or Project Manager in our progressive organisation located in Edmonton, Alberta.

OUR OPPORTUNITIES

Come and work in a professional consulting organisation with the opportunity for advancement and growth in a challenging and stimulating environment. Appointment level and salary will be dependent upon experience. Benefits include contributory pension, life insurance and medical/dental plans.

Relocation assistance includes air fare to Alberta for successful candidates and their families together with various settling-in allowances.

An interview team will be in the U.K. in February, 1982.

Please send curriculum vitae by February 1st, 1982 to:

Mr G. D. Ireland,
 Alberta Government Services,
 200 Mahoodway Mobility Office
 Government of Alberta
 Alberta House,
 Edmonton Street,
 London W1Y 5AA



EXPERIENCED RECRUITMENT CONSULTANTS

Do you have a successful record dealing with contract and/or permanent computer personnel, and want to join an established consultancy where results are rewarded?

If you are interested, then phone 01-439 2621 between 10 a.m. and 4 p.m. any weekday quoting reference CW211.

PROGRAMMERS

BEDFORDSHIRE

Up to £8,500 plus bonus

We require several Programmers with at least one year's experience in

★ ICL SYSTEM TEN/25

All successful applicants will demonstrate that they have the potential to develop their own skills and must be able to work with the minimum of supervision whilst providing assistance to other staff.

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PICK UP THE TELEPHONE NOW

Contact either: Alan Jephcott or Bill Bray
 Lloyds Bank House, 39 High Street
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 Telephone (0767) 316286

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Computer Systems Consultants

Process Control

London & Scotland £18K - £20K
Sound experience in design or process control systems in the petro-chemical industry, using CORAL, ASSEMBLER, PML, Ferranti Argus 700, microcomputers etc.
Contact: Bill Ryan

UK Herts

£12K - £18K
Systems engineers, at least 3 years experience of CAMAC in a software-hardware development environment.
Contact: Bill Ryan

Holland

£15K - £22K
Technical writers, first class knowledge of software and proven ability to upgrade software documentation. At least 2 years experience and educated to degree level.
Contact: Bill Ryan

Operators

International Bank
to £7,500 + mortgage etc.
New computer (Univac System 80, OS/3) and new machine room with a 2 shift system. These are excellent career opportunities. Ideally, you will have 2 years + experience gained on Univac 90 series (OS/3) but experience on NCR, Honeywell, ICL, Burroughs etc is very acceptable.
Contact: Bill Theobald

MVS Operations

Middlesex £7 - £14K
A computer service bureau in Middlesex have openings for operators, senior operators and shift controllers with MVS/JES2, IMS and VTAM experience.
Operators will require at least 2 1/2 years experience whilst the Shift Controller must have spent at least 7 years in IBM operations, including some time in supervisory roles.
Excellent salaries and shift allowance are offered and benefits include free BUPA, health insurance and a pension scheme.
Contact: Pat Barnes

Anal/Prog

N.E. Surrey
Located in pleasant offices in North East Surrey, our client is developing sales and marketing systems on a recently installed IBM System 38. An Analyst/Programmer with several years RPG and System 32/34/38 experience is required to join the small development team. An attractive salary, negotiable to £14K is offered and the company benefits include staff discount, pension scheme, restaurant, and an active sports and social club with its own bar and swimming pool.
Contact: Pat Barnes

Consultants

Analyst/Programmers
to £15,000
to £13,500
RPG/System 38/Banking
Our client is a well established systems house with a friendly professional profile, offering you a place to learn if you are interested in becoming involved exclusively on IBM S.38 banking systems, please telephone to discuss in confidence. Your skills should include:
RPG/III,
International Banking or Both
Contact: Bill Theobald

CAPP ASSOCIATES

01-686 9693
Capp House, 96d South End, Croydon CR9 3SD
Computer and Professional Personnel Consultants

RPG/III

to £14K

City

Lead Programmer
to £11,000

Bright Programmer
to £8,000

A well established profitable organisation with extremely interesting, exciting development projects. With a variety of hardware including a super mini and a small mainframe, they have a friendly environment with an extensive development programme closely scheduled into the late 80s.
The Lead Programmer will organise and control the programming activities of a staff, with emphasis on quality control, scheduling, libraries, design standards etc. They are seeking to implement the best of modern structured methods. Applicants should have good working Cobol plus, ideally, experience of PL/I or a similar block-structured language and be conversant with modular programming techniques.
The Programmer will ideally be a Computer Science graduate with at least a year's practical Cobol experience. It is envisaged he or she will become involved in both systems/software programming and applications development.
Contact: Bill Theobald

Telephone
Portugal, Italy, USA,
Germany, Switzerland
c. £25K
Software/hardware engineers. Several years experience working on System X or similar. Good working knowledge of Cobol.
Contact: Bill Ryan

Mathematical

Programmers
Germany
to £22K
Several years Fortran programming experience. Maths, Science or Astronomical science degree.
Contact: Bill Ryan

Contracts Division

To meet the demands of our existing clients for whom we recruit permanent staff we have now formed a Contracts Division.

We have assignments throughout the UK for:

Analysts

- most major hardware
- working on financial and accounting, order processing, stock control and production planning and control systems.
- good implementation experience required.

Programmers

- most major hardware
- COBOL, PL/1, ASSEMBLER
- varied applications
- software can include CICS, DL/1, MVS DOS/VS, VME, DME, GEO, GCOS, TDS, IMS etc.

We will pay top rates which will ensure that you get the FULL reward for your abilities.

Urgent Requirements

We need ANALYST/PROGRAMMERS for 1st FEBRUARY or soon after, for an assignment in NORTH EAST ENGLAND. Stock control and costing systems implementation.
IBM background required. COBOL, OS, CICS and DL/1. COPICS an advantage.
Minimum 3 months - likely extension.

Rate: £400 - £450 per week

We will pay our contract staff the TOP RATES for their abilities. Find out how we can help you to earn more by telephoning us today.

Ivor Norton Management Services Ltd.
RECRUITMENT CONSULTANTS
P.O. Box 63, Copthall Tower House, Harrogate, HG1 1TS.
Telephone Harrogate (0423) 55311.
(24 HOUR ANSWERING SERVICE)

Information Processing People Invite Recruitment Consultants to Holland

For a change of scenery come and join us in our European Offices in Holland. We are a specialist computer recruitment consultancy with an established track record throughout the United Kingdom, Europe and North America.

Building on our recent successes we are seeking to recruit a number of experienced consultants to assist us in achieving our significant growth plan for 1982.

ROTTERDAM

Branch Manager

Senior Consultant

The successful candidates will be under 35 years of age, have a minimum of 2 years experience in computer recruitment and will ideally have had some exposure to the overseas market. Both positions carry a significant salary package, (incl. tax advantages) and commission plan. Other benefits include COMPANY CAR AND APARTMENT.

LONDON

Senior Consultant

Consultant

If Holland isn't for you why not join us in London? Candidates should have 1-3 years experience in computer recruitment or a related discipline. You will be joining an experienced team of professionals operating in the commercial and technical computing markets.

If you wish to hear more about IPP and our plans for 1982 please contact Colin Hush on 01-938 1804, or alternatively call Jack Cowdy in Rotterdam, STD 0103110 779424.

IPP Information Processing People
Specialist Recruitment Consultants
20 Kensington Church Street,
London W8 4EP
Tel: 01-938 1804 (24 hours).

Heemraadsingel 105, 3022
CB Rotterdam,
Nederland 010-779424.

CHIEF ANALYST

LONDON
A Chief Analyst with significant experience and commercial awareness gained within the Financial sector is required by a major Bank. The successful applicant will have the drive and initiative to lead a large team and see important projects from inception to completion. Professionally qualified or a Graduate and probably aged around 30, this could be your chance of real responsibility and a really excellent benefits package.
Ref: R3464

SENIOR ANALYST

HERTS
An opportunity to join an expanding department utilising some of the most sophisticated hardware and software currently available. If your background has involved plenty of user contact and development of your own commercial awareness and inter-personal skills our client offers the chance to exploit your abilities to the full in an IBM environment. Benefits are as would be expected from a major Company who are a leader in their field.
Ref: R3464

SENIOR ANALYST/PROGRAMMER

CITY
A leading City Bank is seeking an experienced Analyst/Programmer to augment its Data Processing department which is currently utilising Wang equipment for the development of financial and integrated Word Processing systems. This is an excellent opportunity for involvement in all stages of Systems design, programming and implementation with very definite promotional and experience of financial or banking applications would be particularly welcome. A superb company benefits package is offered including mortgage subsidy.
Ref: C5664

PROGRAMMERS

LONDON
A major manufacturing company is seeking two experienced Programmers to enhance its MACRO experience with DEC equipment working under RSX-RT11 or RT11.2 with some experience in industrial applications being an added advantage. These are excellent opportunities for progression within a development environment with a company offering a good basic salary plus excellent benefits which include a Profit Sharing scheme and where necessary re-location.
Ref: C3309

PROGRAMMERS

BERKS
Berkshire currently offers some exceptional opportunities for people with COBOL experience. Three major companies are extending their DP facility and require programmers at all levels with on-the-job structured programming experience. If you are familiar with HP 3000 or IBM 4300 Database software Targa immediately for an introduction to these superb positions.
Ref: R3467

TARGA COMPUTER SERVICES

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24-hour Answerphone
01-283 9941

Targa

RPG

LONDON
Demand for Programmers and Analyst/Programmers with RPG II or RPG III experience still exceeds supply. We are in touch with many clients in industries including Banking, Distribution, Manufacturing and Software Houses offering a choice of a wide range of application areas. Make 1982 the year your career took off - call Targa for an early interview.
Ref: R02EN

ANALYST/PROGRAMMERS

CITY
Our client, a City based commodities house, currently utilising DEC equipment working under RSTS/E requires further Analyst/Programmers with sound experience of BASIC and/or BASIC-2. An applications background involving financial or general commercial work would be advantageous but is not essential as a good knowledge of the programming/software disciplines is of prime importance. A salary commensurate with experience will be paid, plus generous company benefits.
Ref: C3718

ENGINEERS

BERKS
A highly successful manufacturing company is seeking experienced engineers to work in the development of microprocessor control systems. These are excellent opportunities for persons with a degree or equivalent who have at least 3 years' experience either in micro-computer software or with micro applications and circuit design.
Ref: C3704

ANALYST

KENT
You may currently be an Analyst/Programmer who aspires to his or her first position involving using Data base facilities and supporting several remote locations. If you are currently frustrated in the search for a full Analyst role then this could be you - excellent benefits including mortgage.
Ref: R3005

SENIOR PROGRAMMERS

ESSEX
An Essex-based company has a requirement for experienced PROGRAMMERS to work in a busy but interesting ICL environment. Our clients handle a large volume of the transactions for the London insurance market therefore an insurance or financial applications background would be required. A minimum of 3 years' COBOL experience, preferably using ICL equipment is programming vacancies occur at other levels and applications are invited from those with slightly less experience. All positions attract an excellent company benefits package.
Ref: C3369

SYSTEMS ANALYST & PROGRAMMER

ESSEX
Our client, heavily committed to the implementation of new systems involving manufacturing development team, has a requirement for a Systems Analyst and Programmer for the COBOL background, with possibly PL/I as well for the Analyst position and a sound ICL background, with possibly PL/I as well for the Programmer. As well as an excellent salary, related to experience, an exceptional benefits package applies, which can in certain circumstances include re-location.
Ref: C3369

CAN YOU SELL SYSTEMS? OR DESIGN SYSTEMS? OR PROGRAM SYSTEMS? When Pay Is Top Echelon

Are YOU
Are YOU
Seeking

Experienced, Motivated Professional?
A top Career opportunity
Board Prospects - Promotion Prospects
A chance to contribute
A chance to lead others?

We need 40+ Extra Staff Immediately

Salesmen & Managers/Director Potential	£15,000-£30,000	+ Car
Systems Managers - Product Managers	Top Salaries	+ Car
Project Managers	10k upwards	+ Car
Analyst/Programmers	Top Market Rate	
Cobol Programmers ICL - Honeywell	Top Market Rate	

We in turn offer the following:

1. Modern Installations, new technology systems with ICL and Honeywell
2. Package-based business systems and original development and projects
3. Attractive salaries, interesting and absorbing projects
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5. Turnkey Hardware and Software deals second to none!
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7. We'll develop you as far as you can go.

We envisage installing up to 300 more systems and packages throughout 1982. We need Salesmen to sell them, Project Managers to design, enhance or install them, Programmers to build the extra packages or special systems, staff to install them, maintain them, document them and re-enhance them further. It is a never-ending growth pattern. More work, more people, more prospects. We need the Staff of today and the Leaders of tomorrow. At every level. Sales Staff throughout the entire UK. Development staff throughout the Midlands and N. Staffordshire. Low cost housing. Attractive salaries, real career opportunities. The chance to be part of tomorrow's world today! Work with leading Manufacturers' products, ICL and Honeywell. The latest MINIS and MICROS. We will pay what you are worth, and keep on developing you. The market all top potential staff are moving to today is the Turnkey/OEM/Package sector. We have been in it 5 years already. How about starting ahead of the field? Help us extend the lead further. Telephone or write to us today for a free brochure. We will give you a first, second interview and a decision within 14 days of contact. You will find yourself, if selected, working for many of the leading UK companies as E.M.S. clients. Examples include Banks, Mail Order, Chain Stores, Food Processors, Chemicals, Engineering, Pottery Manufacturers, Car Leasing Systems. So much opportunity for you, so many options. A career second to none! Telephone or write today. We will be expanding every month for the next few years. Why wait? Respond today, whatever the date you are reading the advert - we will still have vacancies. Interviews will be in Birmingham or Newcastle, Staffs initially.

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